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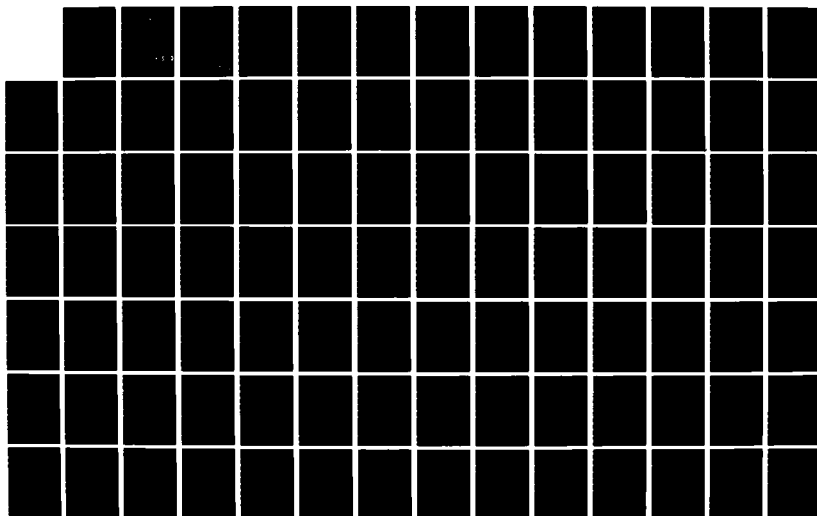
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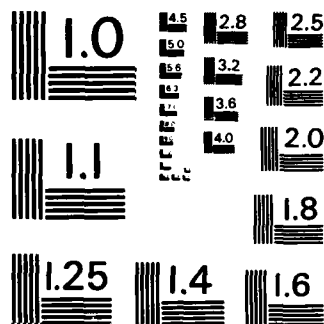
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AT AN AIR LOGISTICS CENTER

THESIS

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AFIT/GLM/LSP/85S-35

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A DESCRIPTIVE MODEL OF THE  
DIRECTORATE OF COMPETITION ADVOCACY  
AT AN AIR LOGISTICS CENTER

THESIS

Presented to the Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology  
Air University  
In Partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Logistics Management

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Abstract

Competition has been promoted as a means to reduce defense costs. Several initiatives within the government have emphasized and encouraged the increase of competition in federal acquisition. A major effort within the USAF is the Air Force Logistics Command's (AFLC) Competition Advocacy program. AFLC has established a Directorate of Competition Advocacy at each of its Air Logistics Centers (ALC) to promote and enhance competition in all ALC purchases. This thesis is a descriptive research effort undertaken to describe the information flows and functional processes that occur within the Directorate of Competition Advocacy at an ALC. The study uses the Integrated Computer-Aided Manufacturing (ICAM) Definition Method (IDEF<sub>0</sub>) to construct the model. The background literature search provides an historical overview of competition in federal buying from the late 18th century to the enactment of the Competition in Contracting Act (CICA) of 1984. The overview also identifies the problems associated with the implementation of increased competition in various market structures and discusses the organizational impacts of such a change.

The results of the research are presented in the form of IDEF<sub>0</sub> diagrams which illustrate the functional processes associated with an ALC's Directorate of Competition Advocacy. Recommendations for the enhancement of competition and future research are also included in the study.

A DESCRIPTIVE MODEL OF THE  
DIRECTORATE OF COMPETITION ADVOCACY  
AT AN AIR LOGISTICS CENTER

I. Introduction

General Issue

Competition has been promoted as a means to reduce defense cost. High inflation and budget deficits coupled with an increase in defense expenditures have caused competition in the defense acquisition process to receive considerable attention in recent years. In 1981, Deputy Secretary of Defense Frank Carlucci proposed 32 initiatives to improve weapon system acquisition, one of which was increased competition. His successor, Paul Thayer, chose the competition initiative to receive his personal attention. As a follow-on measure, the Air Force Management Analysis Group (AFMAG) was established in June 1983 to identify and resolve long-standing spare parts acquisition problems. An underlying assumption of the group was that increased competition will lead to lower costs for spare parts. In its final report, the AFMAG recommended that an advocate for competition be established at each major purchasing organization. Additionally, Congress legislated increased competition into federal contracting. To facilitate competition, each contracting agency in the Department of Defense (DoD) was directed to establish competition advocates.

The Air Force, through its Major Air Commands established the Competition Advocate Program. Within AFLC, the AFMAG report recommended that the Competition Advocate be established at the Directorate level at each of the Air Force Logistics Command's (AFLC) five Air

Logistics Centers (ALC). After two years in operation, the Air Force needs to examine how AFLC has implemented the Competition Advocate program under the recommendations of the AFMAG.

#### Specific Problem

AFLC has made a significant investment in manpower establishing the Competition Advocate Program. A major reorganization at each of the Air Logistics Centers has created new Directorates of Competition Advocacy which report directly to the Center Commander (1:1). In the new role as an equal with the Material Management and Contracting Directorates, the Competition Advocate should be more effective in increasing spare parts competition. The increased competition should result in the Air Force paying lower prices for spare parts. This research will address the role of the Directorate of Competition Advocacy in supporting overall Department of Defense objectives for competition. Further, the functional processes and communication networks within the newly created Directorate will be defined.

#### Investigative Questions

Three investigative questions have been developed to support the purpose of this research:

1. What is the role of competition in the defense acquisition process?
2. What factors or events led to the creation of the Directorate of Competition Advocacy at AFLC's Air Logistics Centers (ALC)?
3. How is the Competition Advocacy Program at the ALC's structured and functioning?

### Justification for Study

To date, no known structured analysis of the Competition Advocacy Directorate's functions has been accomplished. This research effort is undertaken to develop a source document to describe the functional processes and interactions within the Directorate of Competition Advocacy. This study will also provide a source document for further research efforts to expand the description of information flows at the Directorate level.

The literature demonstrates that the Competition Advocacy role in the acquisition of spare parts is an essential element of cost reduction. Therefore, the effective management of this function cannot be overemphasized. This research effort will provide the Competition Advocacy function with an in-depth description of the functions and processes necessary to achieve increased competition in the acquisition of replenishment spare parts. The managers should then be able to identify potential areas for the development of a management information system.

### Background

To understand the role of the Competition Advocate one must be familiar with the basic concepts of competition in the free market environment. This explanation of competition and market structure is necessary since the perceived significance of competition on military spending is often compared to the private sector. Sheth, Williams, and Hill state:

While there are indeed significant differences in the public and private sectors, there are also striking similarities



between the two sectors, both in the purchasing decision process itself and in the types of purchasing decisions made [2:7].

Further, an insight into the complex environment of purchasing in the defense markets enables one to more clearly understand the significance of accurate and timely information to the decision maker. The Directorate of Competition Advocacy at the ALC is challenged with increasing competition in the replenishment of spare parts. The information process within the Directorate of Competition Advocacy is essential to accomplishing this task.

Competition Defined. The controversial nature of competition is illustrated in the highlights of the Air Force Systems Command's (AFSC) conference with industry, titled Report Card '82. According to the report, industry considers the military buyer, especially on cost-plus types of contracts, as working very hard at trying to create the appearance of "competition" without really appreciating what true competition is (3:22). To eliminate some of this ambiguity, two formal definitions of competition are provided. Webster's Third New International Dictionary defines competition as follows:

1. the act or action of seeking to gain what another is seeking to gain at the same time and usually under or as if under fair or equitable rules and circumstances: a common struggle for the same object especially among individuals of relatively equal standing 2: a contest between rivals: a match or trial between contestants ..... 4b: a market condition in which a large number of independent buyers and sellers compete for identical commodities, deal freely with each other, and retain the right of entry and exit from the market 5: ..... [4:464].

Competition in military contracting takes on a broader and more complex meaning than the basic idea of price competition most often

associated with the term. The Compendium of Authenticated Systems and Logistics Terms, Definitions, and Acronyms provides the following definition of competition:

Spare parts purchased by means of solicitation and receipt of offers from two or more responsible sources presumed to be acting independently to secure the order, by offering or negotiating the most favorable price, quality, and delivery terms; or by means of formally advertising the requirement to all known qualified sources. Solicitation of the present time contractor and vendor only shall not be considered competition unless it is established that both sources (i) are technically and otherwise qualified to furnish the requirement and (ii) are expected normally to contend for contracts for the item. Procurements shall not be considered as competitive where solicitation was restricted to a prime contractor and his vendor for the item and only one responsive offer was received. However, except when the solicitation is restricted to the prime contractor and his vendor, competition may be considered to exist even though only one offer is received when offers are solicited from at least two responsible offerors who normally contend for contracts for the same or similar items. In all circumstances, repeated procurements of an item assigned PMC 1 [Procurement Method Code 1] when only one responsive offer is received will require rescreening the item (AFR 57-6) [5:142].

While factors such as quality and delivery terms are clearly significant, they are not exclusive to military and government contracting. The market environments in which the contract is made, has a major effect on the factors which influence the competitive environment.

Market Environment. The classification of market structures is determined by the degree of competition in the market for a particular good or service (6:297).

Two key elements are involved in determining market structure: the number of buyers and sellers in the market and the extent to which the product is standardized. These factors in turn, are influenced by the nature of the product, the form of the industry's production function, and the characteristics of the consumers [6:298].

For reasons beyond the scope of this study, the Department of Defense and the individual Service Departments choose not to engage in a large-scale organic manufacturing activity. Instead, each Department relies upon the private business sector to provide the goods and services necessary for their organizational objectives. The historical meeting place of buyer and seller is called the "marketplace" or more simply the "market."

While the market structure is determined by the buyer, seller, and product characteristics, the market structure will, in turn, determine the behavior of the supply and demand forces (6:297-334). Classical economic theory supports this view of the supply and demand forces within the marketplace. Adam Smith describes the supply and demand forces as follows:

When the quantity brought to market exceeds the effectual demand, it cannot be all sold to those who are willing to pay the whole value of the rent, wages and profit, which must be paid in order to bring it thither. Some part must be sold to those who are willing to pay less, and the low price which they give for it must reduce the price of the whole. The market price will sink more or less below the natural price, according as the greatness of the excess increases more or less the competition of the sellers, or according as it happens to be more or less important to them to get immediately rid of the commodity [7:74].

Smith's observation summarizes the basic relationship between supply, demand, and competition within a given market structure. That is, when supply exceeds demand for a given commodity, the seller reduces price and thereby increases competition among the sellers. When demand exceeds supply for a given commodity, the seller increases the price and thereby increases competition among the buyers.

Market Spectrum. The underlying principles of market types and component behavior can be viewed as a spectrum, (Figure 1-1), of varying degrees of competition. Within each market structure are the constituent elements as well as their behavior. For the purpose of this research effort, the market structures will be defined in terms of the buyer, the seller, the product, and the type of competition present in the particular market.

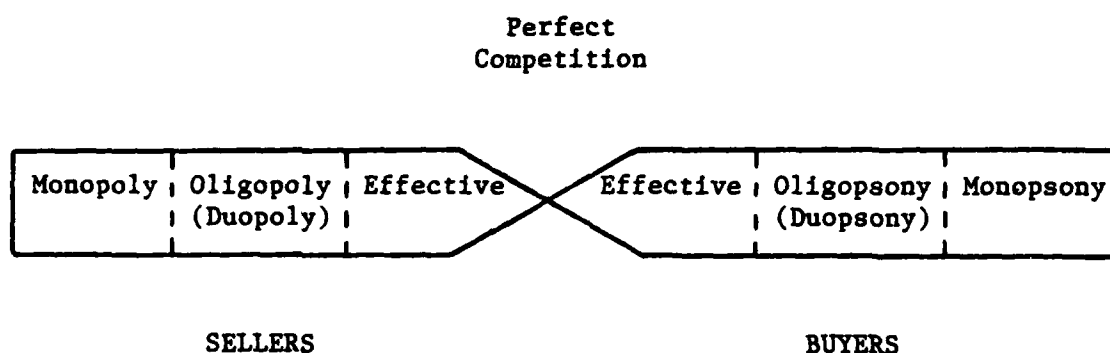


Figure 1-1. Market Spectrum [8:2]

Perfect Competition. At the center of the market spectrum is perfect competition. Perfect competition best supports the theoretical supply, demand, and competition model. It is characterized by unlimited buyers, unlimited sellers and no distinction in product. There are no barriers to entry or exit for the seller. The buyer, in turn, has access to each seller. And, the cost, price, and quality information is known by all buyers and sellers (9:217).

Effective Competition. Effective competition has a limited number of sellers, and a large number of buyers, who each purchase only

a small part of the total output. The product of each seller is perceived equal to the product of any other seller in the industry. However, the number of sellers must be large enough so that no single seller dominates the marketplace. All sellers are active rivals, and new sellers can enter the marketplace easily (8:2).

Oligopoly and Duopoly. In a purely competitive market, the buyer has no influence on the market. However, when the number of sellers is reduced to a few, there is at least one seller whose economic influence has to be taken into consideration by at least one other seller when planning its market action (10:3). The buyer perceives product differences in an oligopolistic market. Cost, price, and quality of information are not completely known to all buyers and sellers. A duopoly is often considered a special form of the oligopoly. Instead of a few sellers, the duopoly consists of only two sellers.

Monopoly. A pure monopoly exists when only one seller is in the market. The seller possesses perfect information and his rewards are based solely on his actions and his knowledge of the market demand (10:40).

Oligopsony and Duopsony. Competition in the market is affected by the number of buyers as well as sellers. Oligopsony and duopsony are characterized by a reduced number of buyers in the market. The result is a reduction in the amount of competition (6:249). An oligopsony is characterized by relatively few buyers and a duopsony by only two buyers.

Monopsony. A monopsony is characterized by only one buyer.

The monopsonistic buyer is at a distinct advantage, since the sellers must compete, without perfect information, to meet the product/price demand of the buyer.

Bilateral Monopoly. The bilateral monopoly is a special case of monopoly/monopsony, where the market is determined by only one buyer and only one seller.

By the very nature of the situation, co-operation is called for. Without some degree of co-operation either side can block trading and thus reduce individual gain to zero [10:42].

Therefore, it is in the best interests of both buyer and seller to share information and realize a gain from the transaction.

Specific Markets. A wide range of market environments exists within the range of contracting activities from the Federal Government as a whole, to the individual ALC. The applicability of these market types depends significantly on the uniqueness of the requirement.

Federal Government Markets. The Federal Government purchases many items for its agencies ranging from office supplies to commodities for redistribution, foreign aid, and agricultural support programs. In this market, generic items, such as office supplies predominate. The General Services Administration (GSA) is the government's agency for a vast variety of items from paper clips to hand tools. GSA purchases such items for all government agencies including the Department of Defense. These commodities can be generally characterized as having relatively low unit costs and high volume. The market structure for these purchases approximates that of effective competition. There are

numerous sources from which GSA can purchase these items, and GSA must compete with the private sector for these same items. In this environment price is the predominant factor in competition. A fair market price is generally achieved as the economic forces of supply and demand strive for equilibrium.

DoD Markets. As the focus is narrowed to DoD, the structure of the markets takes on greater variety and complexity. Within the DoD the Defense Logistics Agency (DLA) is responsible to the Secretary of Defense for providing services and supplies used in common by all the military services. In its supply role for the military services, DLA buys a large volume and variety of items. Commodities include food, clothing, petroleum, medical, general, industrial, construction, and electronic supplies. Another category includes hardware items used in the maintenance and repair of military equipment. With a volume, over \$14 billion, and millions of items purchased annually, DLA is involved in numerous market structures (11:1-6). Many of the items are like those purchased by GSA in that they are compatible with products openly marketed to the general public. In this situation DLA operates in a purely competitive market. However, for some classes of industrial plant equipment, oligopolistic competition characterizes the market environment. In such a case, there are many potential buyers to compete with DLA, and only a few qualified suppliers. As the Department of Defense's central purchasing agent for fuel, both petroleum and coal, DLA is clearly in an oligopolistic market. There are a limited number of fuel producers; however, DLA competes with every fuel consumer in the Nation.

In contrast to these general examples, the DoD through its major weapons system purchases enters into a much different competitive environment than is normally encountered in the private sector. In this situation the Department of Defense through its separate military services becomes the only consumer. Further, there are only a limited number of producers of such equipment as tanks, submarines, and combat aircraft. In this monopsony environment, competitive pressures vary significantly from the market structure typically thought of when competition is addressed. Price competition, in this case, may take a lesser role depending on the urgency and technical considerations of threat assessment (8:16). These complications of the major weapons system market are presented in the discussion of Air Force markets.

Air Force Markets. In terms of dollar amounts, two major commands, Air Force Systems Command (AFSC) and Air Force Logistics Command (AFLC), perform the majority of contracting within the Air Force. AFSC has the prime responsibility for the development and acquisition of major weapons systems, such as aircraft and missiles. This market is typified by a small number of prime contractors in the military aerospace business. Further, subsystems such as jet engines are limited to less than five competitive firms. With only the Air Force and the Navy as the primary purchasers of fixed wing military aircraft, a duopsony exists on the consumer side of the bargaining table. The limited number of suppliers presents oligopolistic, duopolistic, and monopolistic forces on the producer side. These conditions may prevail through the conceptual and development phases of a system's acquisition. From an historical perspective, the production



phase has been reduced to a bilateral monopoly in which the Air Force is the only buyer and the contractor is the only seller. This limited competitive environment extends through the prime contractor structure down to the sub-contractor level. A weapon system transitions from the acquisition phase to the operational and support phase of its life cycle at Program Management Responsibility Transfer (PMRT). At PMRT, AFLC assumes responsibility for providing the follow-on support in the form of replenishment spare parts, modification, repair, and maintenance.

AFLC Markets. Since decisions made during the acquisition process carry forward into the operational phase of the weapons system's life cycle, AFLC is faced with many of the same market structures encountered during acquisition. Further, through its interface with GSA and DLA, all market structures are involved. With follow-on support comprising the majority of a weapon system's life cycle cost, competition in this area shows the greatest potential for cost reduction (12:1-2).

#### Methodology

The research task of describing the Competition Advocacy Directorate at the ALC will employ two basic methods; the Literature Review and Structured Analysis. The literature review will provide the essential background and historical development of the Competition Advocacy Program in AFLC and establish the functional and organizational relationships for the Directorate of Competition Advocacy at the ALC. To describe the information requirements and associated

networks, a structured analysis modeling technique IDEF<sub>0</sub>, will be used. IDEF<sub>0</sub> is an accepted and validated structured analysis technique, and provides a graphical model of the system's architecture from a functional orientation. Data gathering to support the IDEF<sub>0</sub> model was conducted at one ALC. The user oriented technique of the structured personal interview more accurately established the real world information requirements and processes.

## II. Literature Review

### Introduction

Chapter I provided the background on economic factors essential for understanding why competition receives so much emphasis in Department of Defense acquisition. In this chapter, the review of literature provides a historical perspective on the role of competition in DoD. The literature review also differentiates the types of competition encountered in the acquisition environment and explains the barriers to competition. Overcoming these barriers to competition enables the Competition Advocate to achieve or increase competition.

### Scope

The first part of the literature review presents the historical background of the purchasing process within DoD. The review starts with the first Federal purchases by the Continental Congress and discusses the major changes in defense purchasing through the years. The historical background concludes with the implementation of the Competition in Contracting Act of 1984 (CICA).

The second part of the literature review discusses the types of competition in the DoD marketplace. The product and its dimensions are then discussed to establish an understanding of the exchange or purchasing process at the ALC level. The organizational impacts and associated strategies for both the buyer (ALC) and seller are then presented to illustrate the organizational barriers associated with increased competition. The second part of the literature review

concludes with a discussion of the market barriers to increased competition.

#### Historical Development of Competition

The early development of the United States purchasing policies changed slowly. While formal advertising was the preferred method, it did not receive a formal mandate until the beginning of the Civil War. The basic legal foundation which remained in-place from 1861 to 1947 varied significantly in application during World War I, the depression years, and World War II. The significant departure from basic contracting policy experienced in World War II set the stage for new policies during the Cold War years. The focus narrowed as the policies and procedures of the 1960s, 1970s, and 1980s were investigated. Historical events and their policy responses of the late 1970s and early 1980s set the stage for developing the current Competition Advocate Program and organizational structure within AFLC. Creation of the Directorate of Competition Advocacy at the Air Logistics Centers took place in an environment punctuated by political activity. Even as AFLC worked to solved the problems in spare parts acquisition, Congress mandated competition with significant legislation.

Early Years. Since the earliest days of the United States, the acquisition of material to support the armed forces has been an integral role and responsibility of government. In 1778 the Continental Congress entered into its first purchasing program by approving the appointment of purchasing commissaries. These agents of the government were commissioned by the Congress to purchase supplies for the

Continental Army. The commissaries were compensated at a rate of two percent of the value of the supplies purchased. By the end of the first year, high cost and the possibility of fraud led to placing the purchasing officers on a \$100 per month salary plus rations (13:3). This system remained in place throughout the Revolutionary War.

Following the Revolutionary War, the Continental Army was reduced to a force of approximately 600 men. This standing force was required to protect military supplies at West Point and other posts. With such a small army, a staff organization to provide supplies was deemed unnecessary and in 1783 purchasing actions were turned over to civilian authority (14:107). In 1787, the transition from the Articles of Confederation to the Constitution gave the federal government the power to raise and support armies and provide and maintain a navy.

The first major defense acquisition was a group of six large frigates to form the basis of the new United States Navy. When directed to begin construction by Congress on 27 March 1794, the War Department, under pressure from political factions, let contracts to six shipyards in six different states. While the number of bidders in this case suggests a competitive environment, political influences obviously entered into the selection process resulting in a less than desired outcome. Delays and cost overruns led to the cancellation of three of the contracts (13:3).

The military purchasing process remained unchanged with the transition to a Constitutional government. The first comprehensive legislative change was the Purveyor of Public Supplies Act in 1795. This Act established the Purveyor of Public Supplies in the Treasury Department

and the Office of the Superintendent of Military Stores in the War Department (14:105-107). A contracting system established by the Purveyor of Public Supplies replaced the existing direct purchase system. The contract system was thought to be more economical and efficient, and competition among bidders was based primarily on price. The major weakness of this system was that product quality and promptness of delivery were dictated by the contractor's profit motives (14:108).

Abuses, allegedly traceable to the misconduct by congressmen attempting to secure favors, led to passage of the Procurement Act of 1809 (14). This legislation established the general requirement for formal advertising in government contracting. The contracting officer had two options, "open purchase" or "advertising for proposal". Either option was equally acceptable. The Attorney General ruled that the advertising method was preferred except where public exigencies necessitated immediate contract performance (15:96).

Arms and supplies to support the military, such as muskets, food, and field gear did not differ significantly from items used in the civilian sector (16: Sec II, 1). Specialized weapons such as cannons were purchased from European sources; however, domestic sources and arsenals were developed to reduce dependence on foreign markets. The competitive environment for most supplies and small arms was effective competition. There were many buyers and sellers in the marketplace.

Civil War Period. In 1861 the Civil Sundry Appropriations Act became the first statutory requirement for formal advertising. Initially, only two exceptions were allowed, contracting for personal services and immediate delivery required by public exigency.

Subsequently, the Courts, the Attorney General, and the Comptroller General ruled that where the existence of only one source made competition impractical, advertising was not required (15:96). Until the passage of the Armed Services Procurement Act of 1947, the 1861 Civil Sundry Appropriations Act was the primary purchasing authority (13:4). During periods of national emergency, special action was taken to modify or waive the requirement for formal advertising.

World War I. As World War I approached, Congress passed the National Defense Act of 1916. The Act granted the President power to place orders for defense materiel and forced industry to comply with its provisions. The Act also established the Council of National Defense to study economic mobilization (14:367). During World War I, the War Industries Board (WIB) was established under executive order to administer defense purchases under the existing statute. Contractors were required to sign a covenant against contingency fees, finder's fees, kickbacks, and payoffs. Although now prohibited by law, cost plus a percentage of cost contracts were the dominant form (13:4). The war also years saw a significant decrease in the formal advertising method of contracting, while sole-source negotiated contracts increased substantially. Despite the actions of the WIB many cases of profiteering were reported (17:23).

Between the Wars. During the inter-war period, significant events changed the way of doing business. The National Defense Act of 1920, reorganized the Army and in effect established a peacetime force (14:407). The great depression brought about an effort to control government spending by centralizing purchasing policy within the

Treasury Department. The consolidation of the purchasing authority was not a new idea. It was proposed by Alexander Hamilton over 100 years earlier (13:4). These efforts to control government spending had little effect on the competitive environment; however, their impact was felt in the effort to solve the economic problems of the depression. As a means to coordinate government spending and stimulate the economy, the centralized program was successful.

The international events in Europe and the Far East brought on the realization of possible American involvement in a world conflict. The acquisition of military equipment soon took on increased importance. This importance was illustrated by the recall of then Major James H. Doolittle to active duty to head a commission that studied the capability of the United States to mobilize its industrial resources for wartime needs (18:236). These studies laid the groundwork for conversion of civilian industries to military production. During the 1930s, while policies supported territorial defense, planning for full mobilization was taking place within the War Department. The Army's Industrial Mobilization Plan of 1930 established the basic principles for converting the nation's economic strength to war needs, and revisions in 1939 improved the plan (14:416). American involvement with foreign aid through the Lend-Lease Act of March 1941 enabled the United States to support its allies openly as the "Arsenal of Democracy." Delivery and technical competence became the key factors in determining the competitive environment as American involvement increased.

World War II. In World War II the need for rapid delivery of technically superior armaments caused the acquisition process to undergo



significant changes. Formal advertising was pushed into a secondary position. Title II of the First War Powers Act of 1941 gave the President the authority to empower agencies connected with the war effort to enter into contracts without regard to existing provisions of the law if it would help the war effort. Executive Order 9001, 27 December 1941, implemented the act and authorized the War and Navy Departments to enter contracts without formal advertising. In March 1942, the chairman of the War Production Board prohibited formal advertising unless specifically authorized (15:97). Clearly public exigency prevailed and most contracts during the war were negotiated under Title II. While the formal advertising method played a minor role in wartime contracting, the controls established for negotiating contracts permitted maximum use of competition. The procedures established during the war formed the basis of the Armed Services Procurement Act of 1947.

The Cold War. At the end of World War II, the United States did not return to the isolationist ways which followed World War I. A new threat was present from the expansion of the Communist Bloc countries, particularly the Soviet Union which dominated Eastern Europe. In this "Cold War" environment, the need to maintain a deterrent force was essential. The lessons learned during World War II led to major changes in the defense structure of the United States.

The War Department was reorganized into the Department of Defense, and the Air Force was established as a separate service in 1947. The Armed Services Procurement Act was passed in 1947, and was designed to meet both peacetime and emergency needs. The Armed Services

Procurement Act consolidated past contracting experience and served as the basis for establishing Department of Defense contracting policy. From these policies, the Armed Services Procurement Regulation (ASPR) was developed. The ASPR provided the contracting functions with the first collective guidance for defense related acquisition (17:22). Formal advertising remained the basic contracting approach. The following seventeen exceptions permitted negotiated contracts rather than formal advertising:

1. National emergency.
2. Public exigency.
3. Small purchases.
4. Personal or professional services.
5. Services of educational institutions.
6. Purchases outside the United States.
7. Medicines or medical services.
8. Supplies purchased for authorized resale
9. Perishable and nonperishable subsistence supplies.
10. Supplies or services for which it is impracticable to secure competition by formal advertising.
11. Experimental, developmental, or research work.
12. Classified purchases.
13. Technical equipment requiring standardization and interchangeability of parts.
14. Technical or specialized supplies requiring substantial initial investment or an extended period of preparation for manufacture.
15. Negotiation after advertising.

16. Purchases in the interest of national defense or industrial mobilization.

17. Otherwise authorized by law [15:107-114].

The trend toward negotiated contracts steadily increased. During the 1950s, the number and types of aircraft purchased grew. The rapid growth was sustained even after the end to the Korean conflict. New technologies were developed and the sophistication of weapon systems steadily increased.

The Cold War saw competition on the technological front expand rapidly. With each new weapon system, new technologies were applied. While the United States held a decisive edge in manned aircraft technology, the Soviet Union made significant gains in the area of ballistic missile development. The launch of the Soviet satellite Sputnik in 1957 marked an increase in American missile development activity to meet the challenge in a new environment (17:23). The technological explosion of the space race was not accompanied by a significant change to the basic acquisition process. Department of Defense purchasing was still conducted under the Armed Services Procurement Act (17:25). Systems acquisition throughout this period emphasized application of new technology, often without a clear definition of the threat against which the new technology would be applied. Additionally, the cost of new systems grew significantly.

The 1960s. During the sixties, Congressional involvement increased directly with the increase in defense acquisition cost.

Michael D. Rich, in a 1976 Rand Corporation study states:

The Congress has always monitored defense policy, but until the early 1960s its participation in systems acquisition was

primarily after the fact. When systems procurement costs of the billions rather than tens of millions of dollars became common in the 1960s, Congress began to participate actively in the systems selection process [19:iii].

Secretary of Defense, Robert McNamara established the Planning Programming and Budgeting System (PPBS) in 1961 to coordinate the planning and budgeting processes. Concern over the increase in negotiated contracts and the potential for abuse led to passage of the Truth in Negotiation Act (PL 87-653) in 1962 (17:23). Late in the decade, a Blue Ribbon Defense Panel was established to review and evaluate the acquisition process. The panel reported in 1969 that the ASPR lacked the flexibility to function effectively in the current environment (20). These findings led to establishment of the Defense System Acquisition Review Council (DSARC) by Deputy Secretary of Defense David C. Packard. The DSARC process enabled senior management to affect control over the complex acquisition process, by conducting reviews at key points. Still concerned with effectiveness of government acquisition, Congress formed the Commission on Government Procurement in 1969. The Commission's work continued into 1972 when it published its findings (17:25).

The 1970s. The work of the Commission on Government Procurement was termed the watershed event of the 1970s by Maj Frank K. Toda in a 1984 Air Command and Staff College (ACSC) report. The Commission's indepth study of the acquisition system identified much needed improvements. Among the recommendations were increased flexibility, increased use of multi-year contracts, formation of an office of federal procurement policy, and resources verification (17:23). The commission's work reflected Congressional recognition that "... Patchwork

solutions to individual problems had created an overly complex system. Given the size of the system, a mere two percent increase in efficiency could translate into over \$1 billion annual savings [21]."

The problems with existing contracting policies were recognized by Secretary Packard and expressed a memorandum issued 28 May 1970. The memorandum emphasized the need for decentralization of decision making and flexibility (22). Decentralization and flexibility formed the basis for developing DoD Directive 5000.1, Major Weapon System Acquisition, published 13 July 1971. The initiatives of Deputy Secretary of Defense Packard and the recommendations of the Commission on Government Procurement provided the basis for publishing the Office of Management and Budget (OMB) Circular A-109 in 1976. OMB Circular A-109 was a major change in acquisition policy because it focused on mission needs rather than hardware. It emphasized cost and performance trade-offs, flexibility, and clear lines of management authority (17:26). The features of A-109 were reflected in DoD Directives 5000.1 and 5000.2. A-109 emphasized the relationship between competition and innovation. Also, in 1976 the ASPR was renamed the Defense Acquisition Regulation (DAR).

The decade of the 1970s was one in which inflation and emphasis on government spending combined to place considerable constraints on defense acquisition. Toward the end of the decade, reports of degraded readiness due to lack of spare parts appeared in the media. Military preparedness became a major political issue as the decade came to a close and international events focused on the crisis in Iran and Soviet expansion. Concurrent with the concern for military preparedness were

recurring reports of DoD's inefficient acquisition policies and the overpricing of spare parts. In 1979 the Air Force started the Zero Overpricing Program to ensure it did not pay excessive prices for spare parts and supplies. Under this program, base level personnel could identify suspected overpricing cases and challenge them through appropriate channels to the supply source (23:121-125).

Into the 1980s. The complexity of the acquisition process became apparent when President Reagan proposed significant increases in defense spending during his first term in office. Concern for improving the defense posture, combating double digit inflation, and reducing the budget deficit called for significant trade-offs in the federal budget. These trade-offs implied offsetting cuts in social programs, and received close Congressional scrutiny. Faced with this situation, the Department of Defense initiated the Acquisition Improvement Program (AIP). In conjunction with the AIP, competition began to receive special emphasis with the development of the Competition Advocate Program. During this rapidly changing era, AFLC appointed Competition Advocates which later evolved into the Directorates of Competition Advocacy. Concurrent with DoD activities, Congress mandated competition in contracting by enacting significant legislation.

AIP Program. To address acquisition concerns, Deputy Secretary of Defense, Frank Carlucci initiated the Acquisition Improvement Program (AIP). On 2 March 1981, Mr. Carlucci chartered five working groups to make recommendations on the acquisition process. Their recommendations were submitted on 31 March 1981 and formed the basis of his 31 initiatives published on 30 April 1981 (24:5). Of the 31

initiatives, none specifically addressed competition; however, this was remedied with the issuance of Initiative No. 32 entitled "Encouraging Competition." On 27 July 1981, Mr. Carlucci stated that: "We believe that it (competition) reduces the cost of needed supplies and services, improves contractor performance, helps to combat rising costs, increases the industrial base, and insures fairness of opportunity for award of government contracts [25:27]."

Competition Emphasized. The report of an Air Force Acquisition Management Review of the Air Force Competition Advocate Program published 23 June, 1984 states:

The exact origin of the idea for Competition Advocates was developed in an OSD contracted study by Don Sowle Associates in May 1980 that recommended the establishment of an individual or office at each major purchasing activity to review non-competitive actions. The GAO later picked up this concept. By 1981, the concept was included in the Uniform Procurement System proposal submitted to Congress by the Office of Federal Procurement Policy [26: Sec II, 1].

These developments tend to explain the delay in including initiative No. 32. In November 1981, following the inclusion of the competition initiative, the services were directed to implement the Competition Advocate concept at each major contracting activity.

In January 1982, the Air Force directed the Major Commands to appoint Competition Advocates which would perform the following:

1. Assume early planning for competition.
2. Identify and correct, when possible, factors that inhibit competition.
3. Assure all reasonable alternatives to non-competitive acquisition are considered.
4. Institute programs to enhance the 'competition consciousness' of the work force.

5. Pursue competition goals [26: Sec II, 1].

Specific guidance for the organizational level or functional placement was not given, thus implementation varied widely among the commands with only limited progress.

AFLC Actions. To implement the Secretary of Defense's guidance concerning competition, the commander of AFLC, General James P. Mullins restructured the Competition Advocate Program. An Office of Competition Advocacy was established at each ALC and AFLC Headquarters. These offices reported directly to their respective Vice Commanders, and were staffed on a full-time basis by a Director and one assistant.

Internal investigation, GAO audits, and media reports highlighted numerous replenishment spare parts problems. To identify these problems and make recommendations, the Air Force Management Advisory Group (AFMAG) was formed in June 1983. The AFMAG made specific recommendations designed to enhance the role of the Competition Advocate within AFLC. The recommendations included:

1. Reorganization with directorate level assignment at each ALC.
2. Increased manpower.
3. Improved training and automated data processing equipment (27: Sec V).

Competition Expanded. Similar to the Acquisition Improvement Program (AIP) and the DoD efforts to institute Competition Advocacy, the Office of Federal Procurement Policy (OFPP) released its proposal for a uniform federal procurement system in February 1982. This proposal began fulfilling the legal obligation of OFPP and addressed a



major restructuring of the Federal Acquisition System. Government purchasing was now conducted under one set of rules. The following quotes from the proposal illustrates this point.

To overcome longstanding problems in achieving effective competition in Federal procurement, the proposed system introduces new statutory concepts of competition, together with new methods to stimulate and expand the use of competition. These new concepts and methods give first priority to what is in the marketplace rather than what ought to be in the marketplace. They are intended to stimulate wider use of competition by stressing substance not form. The system also established focal points to advocate and help plan for competition. It statutorily restricts non-competitive procurement to very special circumstances [21:27].

A major point of this change was to overcome the misconception that competition and negotiated contracts are mutually exclusive events. The proposal goes on to point out the restrictive nature of formal advertising with its inherent requirement for detailed design and performance specifications. A range of competitive options was proposed which include:

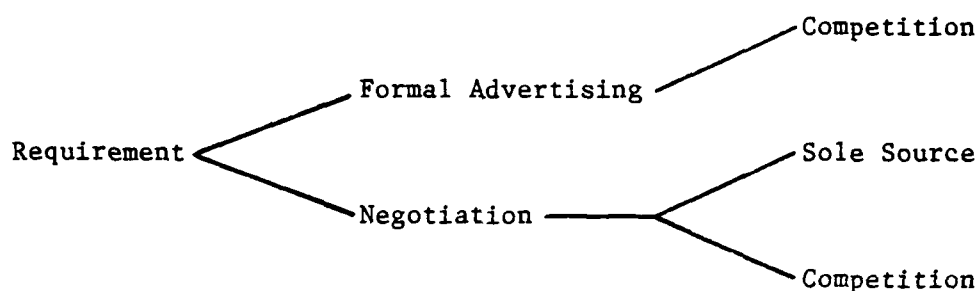
Price. Competition based on the price to the Government

Lowest Total Cost. Competition based on total cost to the Government including such considerations as purchase price, and maintenance and operating costs over the useful life of the product or service.

Multiple Factors. Competition based on price or cost and such other factors as design, performance capability, service, delivery, and technical and management ability [21:32].

"With this perspective, formal advertising and negotiation simply become methods of contracting, and competition becomes a viable tool rather than a procedure [17:33]." Figure 2-1 illustrates the difference between the then current and proposed system.

FOCUS OF THE CURRENT SYSTEM ON COMPETITION



FOCUS OF THE PROPOSED SYSTEM ON COMPETITION

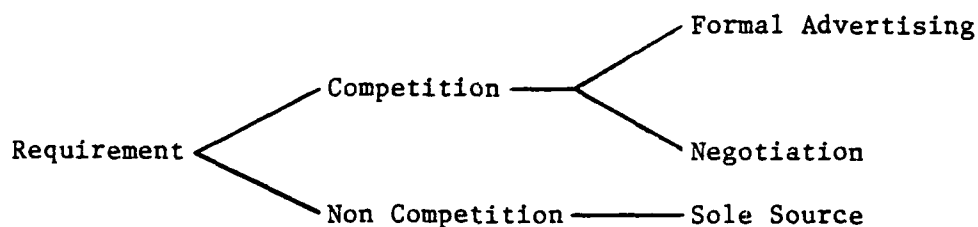


Figure 2-1. Focus On Competition [17:34]

The Air Force position was summarized in an article by Major General Joseph H. Connolly in the fall 1982 issue of AF Journal of Logistics:

Competition is a basic tenet to the contracting process..... Competition is a tool with several uses; it can result in lower prices, better performances, and fairness in awarding contracts. We recently set goals for major commands and agencies to increase their levels of competitive awards. [28:3].

Major General Connolly went on to describe the role of the new competition advocates as follows:

The "advocate" reviews proposed noncompetitive contracts to insure competitive alternatives have been considered. The advocate will not be a "contracting" individual but will be from an activity responsible for determining requirements. Advocates will see that competition is not inhibited by poor planning or unnecessarily restrictive requirements [28:3].

DoD continued to emphasize competition in the AIP. In an 8 June 1983 memorandum, Deputy Secretary of Defense Paul Thayer selected competition one of six initiatives to receive his personal attention. He stated, "These areas of emphasis offer both the greatest management challenges and the highest potential payoff [29]." While progress was being made, continued media exposure focused on problems in spare parts acquisition. Secretary of Defense Casper W. Weinberger announced a ten point program on spare parts in a memorandum on 25 July 1983 (30). In a subsequent memorandum on 29 August 1983, Secretary Weinberger stated his concern for spare parts acquisition:

I am resolved that the Department of Defense act decisively. Nothing short of our full management capability and technical expertise must be applied to this challenge. Our credibility before Congress and the public is at stake. Accordingly, I am now directing the additional actions set forth below [30].

There were 17 near-term (within 90 days), 6 mid-term (within 180 days), and 2 long-term actions. The actions focus on ways to increase competition and ensure fair and reasonable prices for replenishment spare parts.

In mid 1983, the Air Staff developed regulatory guidance for the Competition Advocate Program (AFR 800-35). The Office of Secretary of Defense (OSD) developed DoDD 4245.XX which expanded the duties of the Advocate Program throughout DoD (26: Sec II, 3). The recommendations of the AFMAG also had a significant effect on the Competition Advocate Program in AFLC. The Competition Advocate was elevated to Directorate level at each ALC in September 1983. AFLC Regulation 23-49, Directorate of Competition Advocacy, states:

HQ AFLC/CV letter, 8 August 1983, Improving the Spare Parts Acquisition Process, expanded the original charter of Competition Advocate to include price screening; item screening for breakout/competitors; management of engineering data; source development; and supplier interface [1:1].

The initial manpower authorization assigned 513 personnel to the new directorates within AFLC. These authorizations were increased to 1473 by FY85 (31). The organization of the Directorate of Competition Advocacy (CR) included two offices and two divisions. The Resource Management Office (CRX) was responsible for: program management, resources management, workload management, training, operational procedures, and Directorate goals, objectives, and reports (32; 33:1-2). The Source Development Office (CRS) was assigned the major responsibilities:

- a. Competition enhancement
- b. Source identification, qualification and development
- c. Non-competitive acquisition review IAW Public law 98-72
- d. Vendor Identification/Breakout action
- e. Liaison with industry [33:2].

The Price Appraisal Division's (CRV) major responsibilities included:

- a. Manage the Pacer Price Program
- b. Manage the Zero Overpricing Program
- c. Review all buy items for Value Analysis
- d. Identify and eliminate overpricing incidents
- e. Develop target price for use by buyers
- f. Assist buyers in spare parts negotiations
- g. Investigate and correct acquisition problems
- h. Improve Acquisition procedures

- i. Manage "Hotline" overpricing referral program [33:2-3].

Engineering Data Management Division (CRE) is responsible for:

- a. Accomplish all engineering data screening
- b. Process all forms 761 and assign all Acquisition Method codes
- c. Replenishment Spare parts Breakout Program
- d. Data acquisition
- e. Reverse engineering
- f. Vendor qualification
- g. New Acquisition Engineering Data Planning
- h. Front end data management with AFSC
- i. Processing PRs/MIPRs
- j. Challenge proprietary rights [33:2-3].

The role of the Competition Advocate was significantly expanded. This change was necessary to "institutionalize" competition in the acquisition of spare parts. Many of these responsibilities were previously divided between the Directorates of Material Management and Contracting and Manufacturing. Limited personnel resources in these directorates had relegated many of the Competition Advocate's current tasks to a lower priority. Each major contracting activity within DoD was taking aggressive action to correct past neglect. General James P.

Mullins stated the case this way:

In solving the parts pricing problem the Air Force is seeking to better exploit the strengths of free enterprise. The innovation and achievement fostered by that philosophy will result in efficiency and timely manufacture of reasonably priced, high-quality products. The steps the Air Force is taking to control cost do not involve constraints and needless regulation but, rather, free competition [34:7].

DoD was not the only department trying to reduce cost and improve the acquisition process.

Executive/Legislative Action. The OFPP and Congress were also involved in trying to improve acquisition and increase competition on the federal level. The Office of Federal Procurement Policy Act of 1979 chartered the OFPP to develop a consistent policy and standardized procedures for all federal agencies. The OFPP developed the Federal Acquisition Regulation (FAR) which became effective on 1 April 1984. The FAR, which derived much of its substance from the Defense Acquisition Regulation (DAR), used simpler language and became the basic acquisition guidance for all Federal Agencies.

In conjunction with the OFPP's proposal to revise the concept of competition, the Senate passed the Competition in Contracting Act of 1983, 11 November 1983. Senate Report No 98-50 states:

The purposes of S. 338, the Competition in Contracting Act of 1983 are to establish a statutory preference for the use of competitive procedures in awarding federal contracts for property or services, to impose restrictions on the awarding on noncompetitive contracts, and to permit federal agencies to use the competitive methods most conducive to the conditions of the contract [35:1].

After resolution in conference committee with the House of Representatives, the bill was included as Part B to the Deficit Reduction Act of 1984, and was passed into law as the Competition in Contracting Act of 1984, PL 98-369. Three major provisions of Title VII of the Act are:

1. Establishes a statutory preference for the use of competitive procedures in awarding Federal Contracts for property or services.

2. Requires the use of competitive procedures by Federal agencies when purchasing goods or services - sealed or competitive bids - unless a statutory exception permits the use of noncompetitive bids.
3. Directs the head of each executive agency to appoint an advocate for competition who will challenge barriers to competition in the procurement of property and services by the agency and who will review the procurement activities of the agency [36:viii].

The competition in Contracting Act of 1984 replaced the existing 17 exceptions to Formal Advertising with seven exceptions to Competitive Acquisition. The law now states:

The head of an agency may use procedures other than competitive procedures only when:

1. The property or services needed by the agency are available from only one responsible source and no other type of property or services will satisfy the needs of the agency;
2. The agency's need for the property or services is of such an unusual and compelling urgency that the United States would be seriously injured unless the agency is permitted to limit the number of sources from which it solicits bids or proposals;
3. It is necessary to award the contract to a particular source or sources in order (A) to maintain a facility, producer, manufacturer, or other supplier available for furnishing property or services in case of a national emergency or to achieve industrial mobilization, or (B) to establish or maintain an essential engineering, research, or development capability to be provided by an educational or other nonprofit institution or a federally funded research and development center;
4. The terms of an international agreement or a treaty between the United States and a foreign government or international organization, or the written directions of a foreign government reimbursing the agency for the cost of the procurement of the property or services for such government, have the effect of requiring the use of procedures other than competitive procedures;
5. A statute expressly authorized or requires that the procurement be made through another agency or from a specified source or the agency's need is for a brand-name commercial item for authorized resale;

6. The disclosure of the agency's needs would compromise the national security unless the agency is permitted to limit the number of sources from which it solicits bids or proposals; or

7. The head of the agency

a. determines that it is necessary in the public interest to use procedures other than competitive procedures in the particular procurement concerned and,

b. notifies the Congress in writing of such determination not less than 30 days before the award of the contract [37].

The provisions of the Competition in Contracting Act of 1984 effectively implement the changes recommended in the OFPP Proposal of 1982.

Two other laws passed in 1984 mandated competition in defense acquisition. First, the Defense Procurement Reform Act of 1984, PL 98-525, required that individual efforts to increase competition be considered as an evaluation factor for contracting personnel. The Act also encouraged competition: to improve replenishment spares acquisition, to attain fair and reasonable prices, and to recover overcharges (38). The second law was the Small Business and Federal Procurement Competition Enhancement Act of 1984, PL 98-577. It enacted the following provisions:

1. Encourage competition
2. Validation of Proprietary Data Restrictions
3. Commercial Pricing for Suppliers
4. Economic Order Quantities
5. Prohibiting of contractors limiting subcontractors sales to the United States
6. Assignment of a Break-out Procurement Representative
7. Planning for future competition (39).



From a historical perspective, competition has been fundamental in defense contracting since the late eighteenth century. The form of contracting has changed significantly due to market factors and national needs. Misconceptions that contract form dictates the competitive nature of acquisition have led to significant problems and apprehension about the ability of Defense Agencies to attain the best use of public funds. This apprehension has led to significant changes in acquisition policy, legislative direction, and organizational responsibilities. Within the Air Force, AFLC has created a separate organization to enhance the acquisition of spare parts. The Directorate of Competition Advocacy faces a significant challenge in trying to correct the problems of the acquisition process. Many of these problems relate directly to the market structure in which defense acquisition takes place. Of particular interest are the types of competition, and the organizational and market barriers to effective competition.

#### Types of Competition

The literature provides numerous examples of the types of competition. One author viewed the types of competition as Research and Development (R&D) Phase competition and Production Phase competition. The main point was that suppliers compete one way when the product is in the R&D phase and another when the product is in the production phase. In the R&D phase, the emphasis is on the technical or design merits of the product, and in the production phase, the emphasis is on price competition (40:4). Another research effort views competition

as solely price competition. The DoD, as buyer, fixes or specifies all attributes of the product and then lets the marketplace, through competition, determine the lowest price (41:2-2).

A third description categorizes competition into three distinct types: price, lowest total cost, and multiple factors competition.

Price competition is based upon the lowest price to the government and is used when the market analysis shows equal or similar products will satisfy the need. .... Lowest total cost competition is used when dissimilar characteristics of products or services are expected to affect the cost of ownership. .... Finally, the multiple factors competition is based upon price, cost, and other factors such as design, performance capability, service, delivery, and technical and management capability. It is the most complex type in which government needs cannot be precisely described, a well-defined solution does not exist, evaluation factors cannot be objectively measured, and technical and management performance is critical. This type of competition applies to the majority of weapon acquisition and research and development efforts [42:156-157].

It is clear that different authors have different viewpoints on the types of competition. The above descriptions categorize competition in terms of price or in terms of the product's life cycle.

Product Dimensions. In addition to describing competition in terms of price or product life cycle, competition can be viewed in terms of three product dimensions. In a personal interview at the Warner Robins Air Logistics Center's Competition Advocate Directorate, Mr. Richard L. Moody, Chief of the Price Appraisal Division described the "Logistics Bubble."

When describing the dimensions of a product, it has often been referred to as the logistics bubble. When you reduce one of the product dimensions another increases [43].

The analogy here refers to describing the product, for purchase in the

marketplace, in terms of schedule, performance, and supportability. Each descriptor can be viewed as a dimension or characteristic of the product. Figure 2-2 illustrates the relationship of product dimensions to product cost.

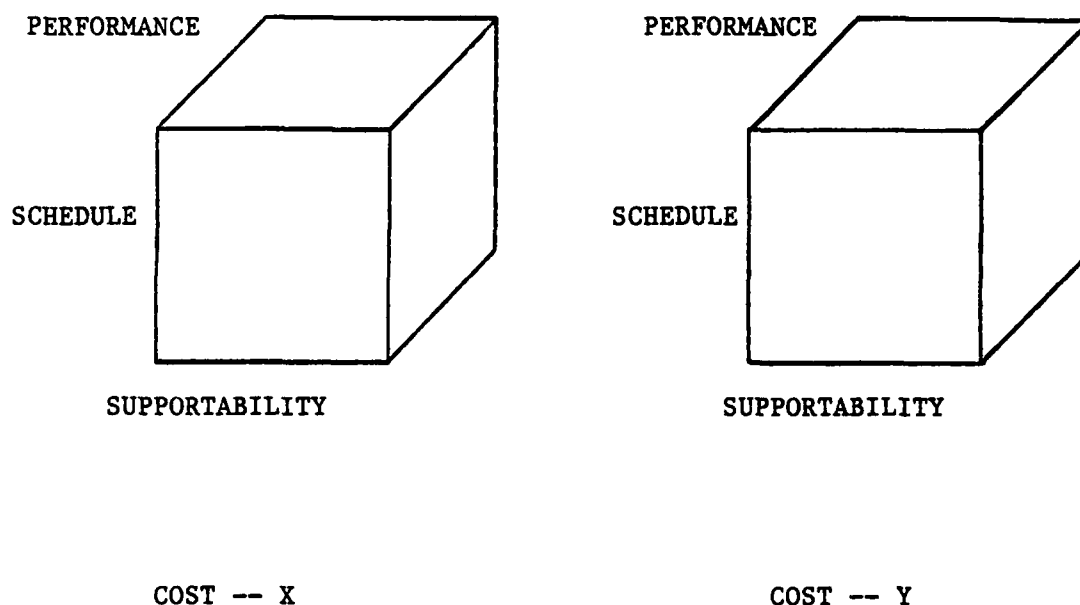


Figure 2-2. Product Dimensions

Cost. Cost is not a product dimension. It represents the amount of resources (money, people, equipment, etc.) that the buyer must exchange in the marketplace for the product or service. Most purchases for an ALC involve the exchange of budget funds (money) for goods or services. Considering only the purchase price as the measure

of product value would be inappropriate since all costs associated with the future use of the product or service must be evaluated over its entire life cycle, including disposal costs. The life cycle cost is often directly related to, or a function of the other product dimensions.

Performance. Performance describes the desired minimum operating or functional standards that the product or service must satisfy. In the development phase of a product, the desired performance characteristics may be hard to quantify or describe. In the more mature stages of a product's life cycle, performance should be very specific and well defined. There exists a trade-off between product cost and product performance when evaluating suppliers and their products.

Schedule. The schedule or time dimension of a product or service describes the desired delivery date. A product or service required next week is entirely different, (of different dimensions), than the same product or service required six months from now. Again, the performance and supportability dimensions can be used as tradeoffs for the schedule dimension. Some examples include: a rush order for a particular component or the requirement of premium transportation to distribute a particular component to meet schedule requirements.

Supportability. Supportability includes the necessary qualities or attributes the product or service must possess to be supported by the logistics infrastructure. Supportability considerations are sometimes referred to as "the logistics tail." Currently, the supportability concept is emphasized through reliability and maintainability plans (44).

Product Competition and the Marketplace. The ALC as the buyer, must go to the marketplace for its needed goods and services. If competition exists among sellers in the marketplace, the three product dimensions can be competed or used as tradeoffs to maximize the desired gain by both the buyer and seller. This tradeoff or bargaining situation can inhibit, as well as, enhance the competitive nature of the marketplace. Assuming a finite amount of resources, the buyer can choose to compete the product on the basis of price alone. This is usually the case when the product's performance, schedule, and supportability dimensions are well known. In this situation, the supplier with the most productive manufacturing capability will usually succeed. When schedule or delivery time differs from the norm, the buyer must determine what product trade-offs to make in order to satisfy the schedule dimension. In the ALC marketplace, this situation may involve paying a premium for the abnormal schedule dimension. ALC's are typically faced with this situation when evaluating the lost benefit (combat readiness) of a grounded aircraft versus the increased resources (money) expended for rapid manufacture or delivery (43).

The performance dimension of a product can eliminate those suppliers from the marketplace whose product is unable to meet the desired minimum functional standards established by the buyer. While performance is critical in all products and services, a substantial tradeoff in the other product dimensions can be achieved by correctly specifying the product or service performance. Superior performance usually involves a more complex design, a longer delivery schedule, and inevitably more supportability resources. Many authors have described

competition in the performance dimension as that which occurs during the research and development (R&D) phase of a product's life cycle (40,41,42).

R&D competition is not distinct from production competition. All product dimensions are present in the R&D phase, as well as, the production phase. The emphasis on performance in the R&D phase can be described as the "performance" of the contractor or supplier's R&D effort and not the finished product of the production phase. The product for sale in the marketplace includes the entire R&D effort, and not just the "end product."

The R&D product is perhaps the most difficult product to describe (42:157). This difficulty arises because the specific product dimensions are design unstable and sometimes impossible to determine. Product evaluation is equally as difficult to achieve because the results of most R&D efforts do not involve the finished product. Since most R&D efforts result in proposals as a finished product, it does not always follow that the supplier of the best proposal will be the supplier of the best finished product. The R&D proposal and the manufactured item are distinct products and should be purchased in the marketplace where competitive forces, according to theory, will determine the best supplier. The above does not exclude the situation where follow-on product development and production is included as a reward for the R&D effort. In this case, the product is not the R&D effort alone, but includes the development effort and the production effort as well. In the case of aircraft design, the sellers with acceptable R&D efforts are usually in the best position to develop and produce the

product they proposed in the R&D phase.

The product's supportability investment can be reduced to increase acceptable schedule and performance dimensions. Reliability, maintainability, transportability, and other logistics considerations often involve the exchange or allocation of future resources within the buyer's organization. Therefore, supportability encompasses tradeoffs with each of the other two product dimensions. Supportability can involve a design change for easier repair, additional testing and evaluation for better reliability, or a simpler design for reduced repair costs. In each case, supportability involves a tradeoff of present resources for forecasted savings of future resources. An inevitable conflict arises when the buyer must decide to exchange a greater amount of present resources for the, as yet unrealized, savings of future resources. Or, the buyer must decide to exchange a lesser amount of present resources and risk the possibility of greater resource expenditure in the future. The above decisions are difficult to make, because the seller's performance is usually evaluated in terms of the present benefit rather than the future benefit.

#### Competition within the Buyer's Organization

Prior to the exchange of resources in the marketplace, competition occurs within the organization for a share of those resources necessary to achieve the organizational goals. To achieve a maximum share of resources for the various goods and services, the governmental departments must compete with each other for their particular share of resources to exchange in the marketplace.

Many economists argue that bureaucrats, too, are best viewed as engaged in rational pursuit of self-interest. Just like consumers, the owners of firms, voters, and elected officials, bureaucrats are best seen as seeking to use existing institutions to their own advantage. .... The achievement of these and similar goals, invariably, is a function of the agency's budget. As a result, utility maximization translates into budget maximization: 'More is always better [45:571].'

Therefore, individuals and organizations can be viewed as competitors seeking to maximize their fair share of resources and enhancing their organization's goal of continued growth.

#### Alliances within the Buyer's Structure

Economist Heinz Kohler describes an alliance within governmental structures that develops between bureaucrats, legislators, and lobbyists. He describes this alliance as an "Iron Triangle" where each member seeks their own interests and jointly promotes overgenerous budgets for pure public goods (45:571). In order to grow, bureaucrats and governmental departments must increase the yearly flow of goods available to them.

Barring gifts or loans from other societies, the people of any society (as a group) can increase the yearly flow of goods available to them in only one of three ways:

1. People can utilize the existing stocks of their resources at a higher rate. That is, they can opt for less leisure and less conservation of capital and natural resources.
2. People can increase the size of their resources stocks and use them at the accustomed rate. For example, they can trade in lowered current consumption for greater investment in human and physical capital.
3. People can increase their productivity. Risk-bearing entrepreneurs, for example, can make innovative



changes that coax a larger flow of goods from identical resource flows [45:318].

To accommodate growth in an organizational setting, the first method, from above, illustrates the organization's use of stockpiled resources to increase the yearly flow of goods available to them. This type of behavior by DoD would be appropriate in a wartime or surge type situation. Clearly, it would not be an appropriate or sustainable means to increase available resources during peacetime operations.

The second method is analogous to DoD increasing its demand for resources and then consuming these resources at the accustomed rate. This behavior demonstrates a stockpiling or build up effort. This type of behavior would be appropriate to the extent that stockpiles are depleted. A continued build up effort would sacrifice current expenditures at the expense of accustomed consumption.

The third method, an increase in productivity, is the most rational approach to satisfy the organizational need for growth. The competition advocacy goal of obtaining more goods at the same or reduced cost is an effort to increase the productivity of the seller through competition in the marketplace. The more productive the seller, the more favorable its position will be to exchange its product in the marketplace, and the greater the amount of goods the buyer will receive from the exchange in the marketplace.

#### Conflicts within the Seller's Organization

While the growth of governmental organizations, particularly DoD, is often discouraged or maligned, the growth of private organizations is encouraged and acknowledged as a desirable organizational goal.

However, growth and therefore organizational survival does not occur without internal conflicts and competition from other goals or organizations. In an article describing the strategic behavior of private seller-type organizations, author Michael E. Porter describes private industries' strategic behavior toward competitive forces.

Once the corporate strategist has assessed the forces affecting competition in his industry and their underlying causes, he can identify his company's strengths and weaknesses. The crucial strengths and weaknesses from a strategic standpoint are the company's posture vis-a-vis the underlying causes of each force. Where does it stand against substitutes? Against the the sources of entry barriers?

Then the strategist can devise a plan of action that may include (1) positioning the company so that its capabilities provide the best defense against the competitive force; and/or (2) influencing the balance of the forces through strategic moves, thereby improving the company's position; and/or (3) anticipating shifts in the factors underlying the forces and responding to them, with the hope of exploiting change by a strategy appropriate for the competitive balance before opponents recognize it [46:143].

Positioning the Company. The seller can minimize the risks from others by developing a strategy that matches the environment of the marketplace.

Strategy can be viewed as building defenses against the competitive forces or as finding positions in the industry where the forces are weakest [46:143].

A seller can ensure success in the marketplace by avoiding or eliminating competition. This objective is in conflict with that of the buyer, which is to increase competition. Given the choice of competing or not competing, the established seller will always choose not to compete. Only when the seller's survival is threatened does he/she compete. The large U.S. automakers first sought governmental quotas

on imports to ease the competitive forces. Some automakers absorbed the competition by signing coproduction agreements. Few, if any, issued a challenge to the competition to compete head to head.

Influencing the Balance. In taking the offensive, a seller deals directly with the forces that drive competition. This approach is an attempt to alter the causes of competition rather than simply cope with the forces themselves (46:144). The seller can minimize competitive forces by vertical integration and thereby eliminating reliance on suppliers. Another strategy is innovative product development. The seller can then make his product distinct from others in the marketplace and thereby acquire brand identification and hopefully consumer loyalty.

Exploiting Industry Change.

Industry evolution is important strategically because evolution, of course, brings with it changes in the sources of competition I have identified. In the familiar product life-cycle pattern, for example, growth rates change, product differentiation is said to decline as the business becomes more mature, and the companies tend to integrate vertically.

.... In long-range planning, the task is to examine each competitive force, forecast the magnitude of each underlying cause, and then construct a composite picture of the likely profit potential of the industry [46:144].

The important point here is, if the marketplace is changing, the seller must develop a strategy that will minimize the planned, future forces of competition. It would be unacceptable for the seller's strategic planners to maneuver the organization (through present policies) into a position where it cannot compete in the marketplace of the future. If the ALC, as the buyer, institutes new policies for its transactions

in the marketplace, then the seller must develop a strategy to cope with new competitive forces. The seller is faced with the decision to continue in the marketplace under the forecasted environment, or to exit the ALC marketplace in favor of a less competitive marketplace.

### Increasing Competition

Frequently organizational change is initiated by a crisis, either from within or outside the organization. The process of change can be simplified using the Lewin-Schein theory of organizational change.

Their theory states that organizational change occurs in three steps.

Unfreezing: Creating an awareness of the need for change and a climate of receptivity to change.

Moving: Changing the magnitude or direction of the forces that define the initial situation; developing new methods and/or learning new attitudes and behaviors.

Refreezing: Reinforcing the changes that have occurred, thereby maintaining and stabilizing a new equilibrium situation [47:144].

While the Lewin-Schein model is a simplification of an extremely complex process, it does provide a framework for the discussion of the implementation of increased competition. The ALCs, as the buyers in the marketplace, are indeed large and complex organizations that face an organizational crisis. The crisis or need for change is an awareness that, as a buyer, the ALC must increase the value of its exchanges in the marketplace. That is, it must, through increased productivity, obtain more defense value for each defense dollar.

Competition is a means of achieving a higher value for ALC resources.

Unfreezing. The initial recognition for change came from within the organization. The Air Force Management Analysis Group (AFMAG)

recognized the need for increased emphasis on competition when buying major weapon systems and spare parts. The findings of the group recommended a full time staff at major purchasing organizations to concentrate solely on increasing competition (27). The external stimulus for unfreezing appeared in the form of public and Congressional interest in the prices paid for spare parts. This external stimulus was often initiated by national news media reports of excessive prices paid for spare parts. Although the media reports were extreme examples of an already recognized problem, they served to increase the organizational awareness for change and to stimulate the receptivity to change.

Moving. A proposed solution to the problem of spare parts buying was to buy in the marketplace in a competitive manner. One method to accomplish this goal was through the Competition Advocacy program. New methods of buying were instituted and previous behavioral patterns were changed. These actions created an additional unknown on the part of the seller, since they involved a fundamental change in the behavioral pattern of the buyer in the marketplace. For example, a previously sole-source acquisition in the marketplace involved a monopsony/monopoly buyer/seller relationship. This relationship dictated certain business strategies on the part of the seller. With increased emphasis on competition the market structure may change to a monopsony/oligopoly relationship or possibly an oligopsony/oligopoly relationship. The seller must now consider the competition, and decide whether to remain in or exit the marketplace. Other sellers, not in the marketplace must also decide whether to enter the marketplace

(compete with existing sellers) or to remain outside.

Refreezing. Once the turmoil of organizational moving ceases, the buyer is then faced with the task of changing the perceptions of sellers. If the sellers are convinced that the competition initiatives are indeed the new way of doing business, they will then develop appropriate strategies to accomplish their organizational goals. For the seller, the task will be to evaluate the entry and exit barriers of the marketplace. The buyer, on the other hand, is tasked to create a stable environment within the marketplace and to convince the seller that competition is the rule rather than the exception.

#### Barriers to Competition

Increasing competition in the marketplace faces a number of barriers. In an ACSC research report, Major Ronald T. Kadish groups these barriers into three major areas: Organizational Inertia, Behavioral, and Technical (48:7-25).

Organizational Inertia. In addition to the turmoil of organizational change, the ALC must confront competition barriers in the marketplace that exist because of the seller's organizational goals.

Prime contractors encourage grinding competition during the developmental phase of the program, but, once the prime contractor is successful, his focus changes from winning the contract to setting new priorities that reflect a sole-source position resulting from the competition ..... For the sub-contract structure, this means that the prime contractor will exert every effort to promote stable production ..... In this environment, he will usually encourage competition only when it is low-risk and convenient, and he will intend to seek second sources, only when the production risks become unacceptable [48:10].

The ALC attempts to overcome this barrier by developing competition in

the early phases of production. During a spare parts purchase, this barrier to competition is reduced by the Source Development Office's (CRS) participation in Configuration Control Boards.

Behavioral Barriers to Competition. The Competition Advocate's efforts to increase competition present a threat to the seller's market share. Therefore, the seller's behavior, in response to this threat, presents an additional barrier to competition.

..... When a firm faces the threat of competition, the primary focus of its marketing strategy is to increase its gross sales and share of the market by striving for a single-source position in the program. The status of single-source ensures a stable production base for achieving corporate goals and long-term economic survival [48:12].

This behavioral barrier is in direct conflict with the Competition Advocates goal to eliminate sole-source purchases. The policies of second sourcing, parts breakout, and contractor teaming force the seller to adopt a marketing strategy that incorporates competition rather than dismissing it.

Technical Barriers to Competition. A third barrier to increased competition occurs when the technical capabilities of the primary source exceed those of potential competitors. Major Kadish presents two ways to overcome these technical barriers:

1. Transfer production of a particular design from one supplier to another, or
2. Compete alternative designs to a performance specification on a form, fit, and function basis [48:22].

The ALC addresses these technical barriers through the acquisition of engineering data and reverse engineering. Once the ALC obtains the necessary engineering data and specifications, the product can then

be effectively competed. The technical barriers to competition are further reduced by DoD's efforts to challenge proprietary rights early in the development stage of a product's life cycle.

#### Summary of Competition Literature Review

Competition has always been a basic requirement of federal purchasing. The methods used to achieve competition depended upon governmental circumstances of the era. Competition is explicit in formal advertising and implicit in the negotiation process. Throughout the historical development of federal purchasing policy, the methods used to achieve effective competition were significantly affected by public and legislative perceptions.

The implementation of effective competition has impacted the market environment. Effective competition cannot be easily achieved in a marketplace where the buyer and seller organizations are operating near the extremes of the market spectrum (Figure 1-1). To increase effective competition both buyer and seller organizations must implement comprehensive policy and organizational changes.



### III. Research Methodology

#### Introduction

Chapters I and II presented support background and justification for research on the Directorate of Competition Advocacy. Chapter I provided an overview of the market structures and the various types of competition unique to each. It also provided a description of the various markets at each level within the Department of Defense. Chapter II expanded the background of competition within DoD to include the structure of the Directorate of Competition Advocacy at the ALCs, the role of the Competition Advocacy Directorate and the methods used to increase competition. Chapter III will focus on the research methodology used to answer the investigative questions proposed in Chapters I.

This chapter provides a description and justification of the approach and method used to describe the Directorate of Competition Advocacy. The methodology presentation encompasses three main areas: the methods used, a background of structured analysis, and a detailed explanation of the Integrated Computer-Aided Manufacturing Definition (IDEF) method of structured analysis.

#### Methods Used

This research effort employed two methods of data gathering. The first method was a review of literature to provide the necessary background for the research effort. The second method of data gathering was structured analysis using the IDEF method. IDEF was applied in an iterative manner using initial interviews and the review of literature

as a basis for the initial IDEF model and then using follow-up interviews to verify the model's validity.

Literature Review. This thesis used the literature review as the method to answer the first two investigative questions. The literature survey was conducted using traditional library research techniques and a computerized search of DoD's logistics database, at the Defense Technical Information Center (DTIC). The review of literature also provided a historical background, and the necessary information inputs and functional relationships for investigative question three.

Structured Analysis. The second methodology used in this thesis was Structured Analysis (SA). Structured Analysis is the broad term used to describe a methodology whereby an entity, organization, process, or other object of interest is broken down and described by its component parts.

The only function of structured analysis is to bind, structure, and communicate units of thought expressed in any other chosen language. Synthesis is composition, analysis is decomposition. SA is structured decomposition, to enable structured synthesis to achieve a given end [49:16].

The decomposition feature of Structured Analysis is the basis for various but similar techniques that breakdown the particular subject matter for analysis. A major tool of Structured Analysis is model building. Murdick and Ross state:

Many forms of models exist, and the particular form selected depends upon the purpose. Generally models may be used to define or describe something such as an MIS, [Management Information System]; to assist with analysis of a system; to specify relationships and processes; or to present a situation in symbolic terms that may be manipulated to derive predictions [50:501].

From a time reference, models can be either static or dynamic.

Static Modeling. The major function of static modeling is to develop the architecture of the system of interest. The "architecture" is referred to as the blueprints, rules, and framework within which the model is constructed.

Hence, the term "Architecture," when used with respect to manufacturing, means a model which is a logically consistent and demonstrably accurate representation of the functions of manufacturing and the relationships between those functions [51: Sec III, 2].

The structure and rules of architecture rely heavily upon the use of the model. Architecture modeling can be a modeling technique by itself or viewed as the framework within which a more defined modeling technique takes place.

An important aspect of model building is establishing the orientation of the models to be produced. For a model to be well-defined one must establish three aspects of its orientation:

- 1) The context, which identifies the subject matter of the model by describing its boundaries.
- 2) The viewpoint from which the subject matter will be described and which governs the emphasis given to various features.
- 3) The purpose or reason for which the model is being created and which will determine its scope, depth, and structure [51: Sec III, 5].

As an example, when modeling a manufacturing process, the "architecture" will be tailored to the needs and background of the "factory." This differs from the "composite" view where an industry-wide aggregation of several views are presented (51: Sec III, 6). The concept of "architecture" is further expanded to include not only manufacturing organizations but whatever object is being modeled.

Dynamic Modeling. As the name implies, Dynamic modeling involves putting the model into action and observing its behavior over time. System dynamics takes the architecture model and puts it into motion:

As soon as a rudimentary measure of understanding has been achieved, a formal model is developed. This model is initially in the format of a set of logical diagrams showing cause-and-effect relationships. As soon as feasible the visual model is translated into a mathematical version [52:5-6].

The system dynamics methodology is a natural follow-on to other modeling techniques and its philosophy rests on the belief that the behavior of an organization over time is principally caused by the organization's structure (52:4). Therefore, the static model can be viewed as a "snapshot" or description of the dynamic model. To realize the full benefits of dynamic modeling as a predictive tool the model must be translated into the necessary mathematical form. Once the mathematical terms are computerized the system can be simulated over time.

Integrated Computer-Aided Manufacturing (ICAM) Definition Method (IDEF)

The United States Air Force as part of its Integrated Computer-Aided Manufacturing (ICAM) Program contracted to develop an "Architecture of Manufacturing." The methods used to define and present that architecture were known as "IDEF" (ICAM Definition Method). IDEF is based on the concepts of structured analysis. An Introduction to IDEF states, "It is a combination of structured analysis techniques that works best. Together, they form a discipline that can be applied to 'systems' generally, from planning to design [51: Sec II, 1]." For an existing system, IDEF can be used to analyze the purposes, the

applications served, and functions performed. Additionally, IDEF can record the mechanisms by which these are done (53: Sec II, 4). The result of applying IDEF is a model which represents the system using diagrams, text, and a glossary of terms. IDEF has been developed into three major types of analysis. IDEF<sub>0</sub> produces a function model and was developed by Softech, Incorporated. IDEF<sub>1</sub>, developed by Hughes Aircraft, is used for information modeling. IDEF<sub>2</sub>, a dynamic modeling technique, was developed by HOS, Incorporated. IDEF<sub>0</sub> was selected for this research effort because of its functional orientation.

IDEF<sub>0</sub>. An examination of the basic functions of the Directorate of Competition Advocacy revealed that the primary processes consist of correcting past deficiencies, achieving competition in current acquisitions, and ensuring appropriate competition in future purchases. IDEF<sub>0</sub> was ideally suited to describing a Directorate of Competition Advocacy. One of the basic concepts of structured analysis stated in An Introduction to IDEF is:

Understand a system by creating a model that graphically shows things (objects or information) and activities (performed by men or machines). The model must properly relate both aspects [51: Section II, 1].

IDEF models may be presented in two forms, the "as is" form which describes current operations or the "to be" form which represents future operations. The "as is" form was selected for this analysis.

Building the Model. Building the IDEF<sub>0</sub> model was an iterative process which began by identifying the basic parts of the system of interest. From the initial step, relationships were identified and refined. The result of applying IDEF<sub>0</sub> was a model consisting of

diagrams, texts, and glossary, cross-referenced to each other. The diagrams were the major components of the model.

The IDEF manual states:

One of the most important features of IDEF<sub>0</sub> is that it gradually introduces greater and greater levels of detail through the diagram structure comprising the model. In this way, communications is enhanced by providing the reader with a well-bounded topic with a manageable amount of new information to learn from each diagram [53: Sec II, 6].

Diagram Symbology. The diagrams of the model derive their utility by illustrating input-process-output relationships. Figure 3-1 depicts a basic function and its associated interface relationships. The mechanism is the person or automated system which performs the operation. Inputs enter the box from the left, outputs leave from the right, and controls enter the box from the top.

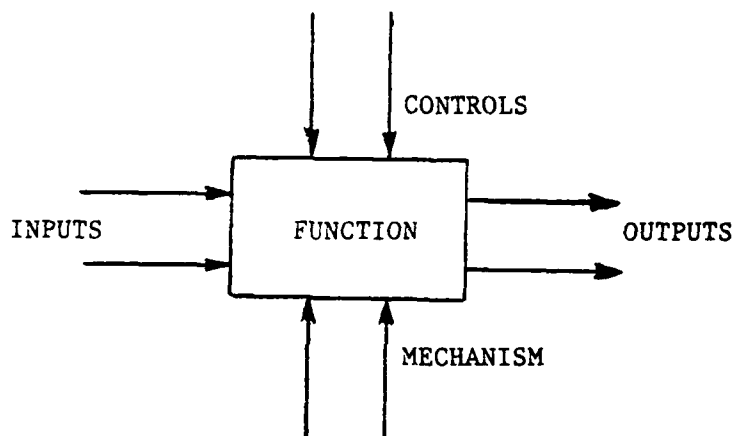


Figure 3-1. Function Box and Interface Arrows [53: Sec II, 6]

Figure 3-2 is a constraint diagram which shows the specific interfaces that constrain each sub-function. It also illustrates the sources and targets of the interface constraints. In this context, the term "constrains" means that a function uses the material or information shown entering the box. The function is constrained from operating by the interface. That is, the function cannot act until the contents of the interface arrow are present (53: Sec II, 6).

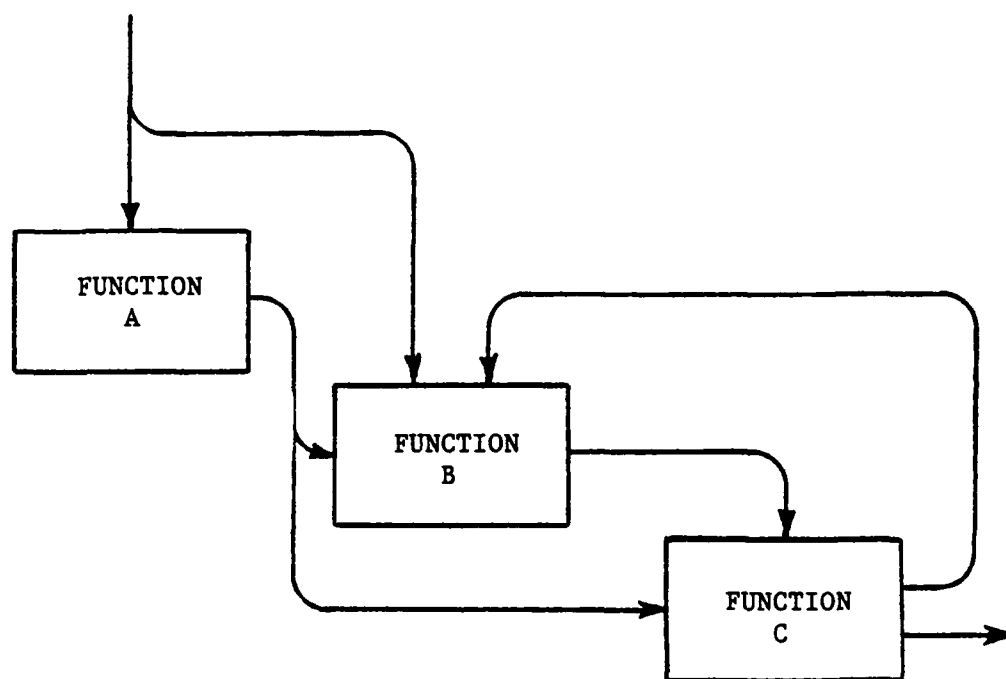


Figure 3-2. Constraint Diagrams

(Function B is constrained by one input and two controls, and produces a single output, which constrains Function C) [53: Sec II, 6].

To match the arrows as they leave a diagram through the boundary and enter the next diagram, IDEF<sub>0</sub> has a special notation.

A specific notation, called ICOM codes, specifies the matching connections. The letter I, C, O, or M is written near the unconnected end of each boundary arrow as an Intput, Control, Output, or Mechanism on the parent box. This letter is followed by a number giving the position at which the arrow is shown entering or leaving the parent box, numbering left to right and top to bottom. For example, "C3" written on an arrow in the detail diagram indicates that this arrow corresponds to the third control arrow entering the parent box [53: Sec III, 19].

ICOM codes are not required to serve the same role on a detail diagram as they do on a parent diagram (Figure 3-3). ICOM codes are used at the ends of all boundary arrows with two exceptions. First, the top diagram in the model does not have ICOM codes assigned. Second, tunneled arrows use parenthesis to indicate their purpose.

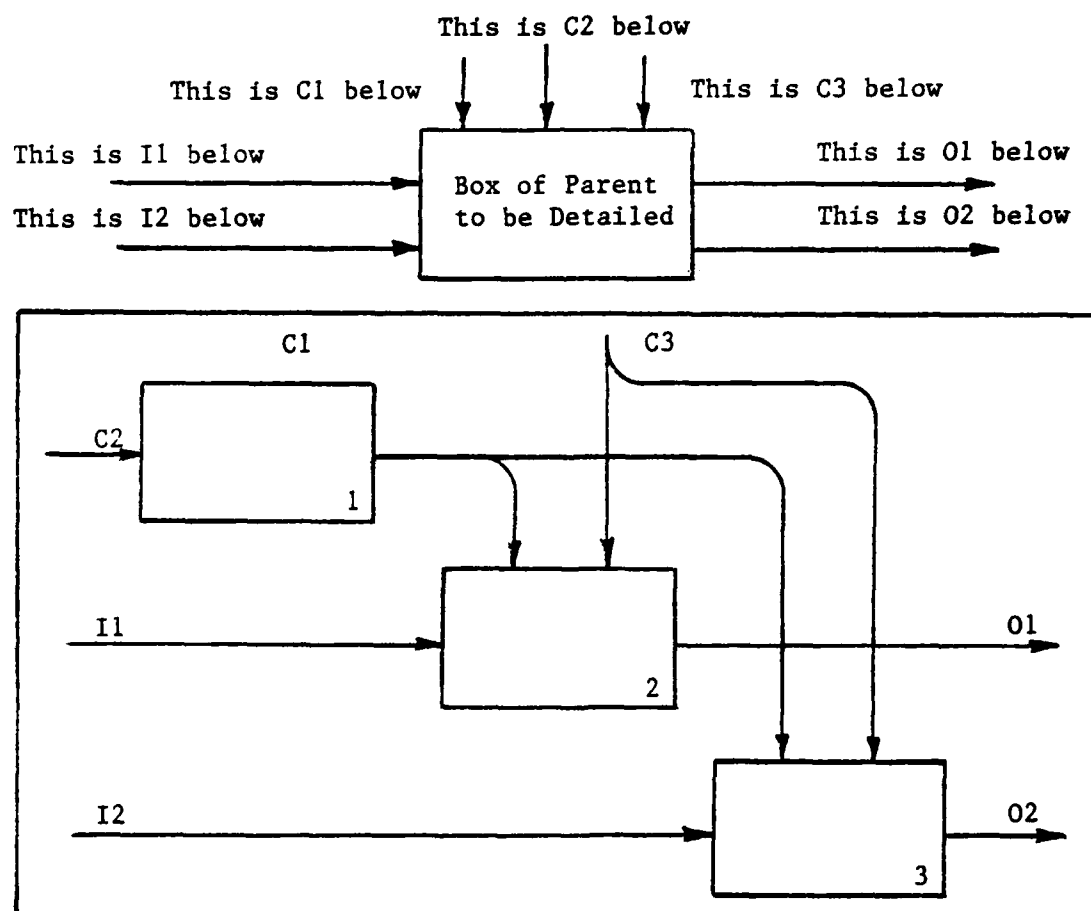


Figure 3-3. ICOM Coding [53: Sec III, 20]



The following explanation from the IDEF<sub>0</sub> manual is provided to give a better understanding of tunneled arrows.

Tunneled arrows indicate that the data covered by these arrows was not relevant to a particular level of detail.

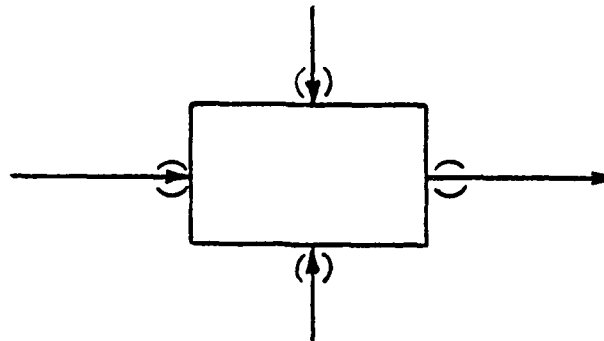


Figure 3-4. Tunneled Arrows at Connected Ends

Tunneling an arrow where it connects to a box (Figure 3-4) indicates that the data conveyed is not necessary at the next level of decomposition.

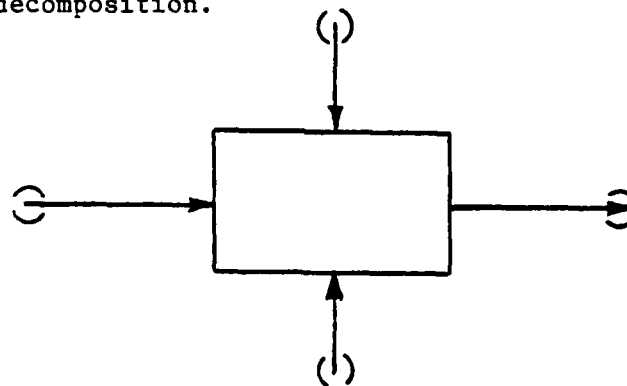


Figure 3-5. Tunneled Arrows at Unconnected Ends

Tunneling an arrow at the unconnected end (Figure 3-5) indicates that the data conveyed is not relevant to or supplied by the parent diagram.

Parenthesizing the unconnected ends says, 'This arrow does not appear in the parent diagram. It has no ICOM code.' Parenthesizing the end where the arrow connects to the box says, 'This arrow does not appear in detail diagrams. Its ICOM code is not tracked from here on and may never be explicitly referenced.' It is possible for an arrow to have a parenthesized arrowhead, disappear for one or more levels of detail, and then be reintroduced at some specific level of detail with a parenthesized end [53: Sec III, 20-21].

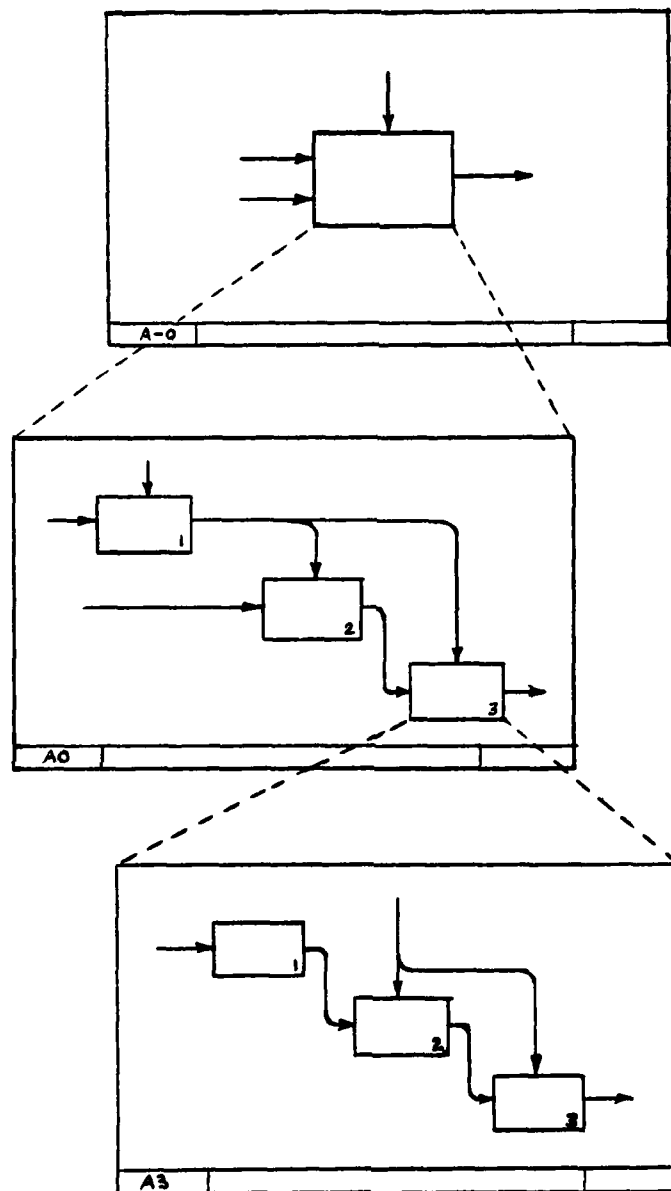


Figure 3-6. IDEF<sub>0</sub> Model Structure [53: Sec II, 7]

Figure 3-6 illustrates how the IDEF modeling process builds from the more general to the detailed.

Key Terms. The following terms are defined here to provide a better understanding of the IDEF<sub>0</sub> process being described. A comprehensive glossary is found in the Appendix.

- |                         |  |
|-------------------------|--|
| 1. Authors (Modelers)   | People who prepare any IDEF model.   |
| 2. Commenters (Experts) | People knowledgeable of the subject being modeled from whom authors may have obtained information by means of interviews, and have enough training in an IDEF technique to offer structured comments in writing. |
| 3. Readers (Experts)    | People knowledgeable of the subject being modeled from whom authors may obtain information by means of interviews, and review documents for information but are not expected to make written comments.           |
| 4. Librarian            | A person assigned the responsibility of maintaining a file of documents, making copies, distributing kits and keeping records [53: Sec V, 4].  |
| 5. IDEF Kit             | A kit is a technical document. It may contain diagrams, text, glossaries, decision summaries, background information, or anything packaged for review and comment. [53: Sec V, 7].                               |

Data Gathering. To build the IDEF<sub>0</sub> model of the Directorate of Competition Advocacy, the authors reviewed directives and conducted personal interviews with key personnel at HQ AFLC and the Warner Robins Air Logistics Center. In the initial phase of data gathering, the literature review provided insight into the functions of the Directorate. The AFMAG study and AFLC Regulation 23-49, The Directorate of Competition Advocacy, were the primary sources. Personal interviews with the staff of the Competition Advocate Office at HQ AFLC provided

the essential information to develop an initial draft, and formed the basis for the model's context and viewpoint (31;54;55).

IDEF model development is an iterative process which requires teamwork between authors, commenters, and readers. When the initial kit was developed, the authors solicited key members of the Warner Robins Air Logistics Center Directorate of Competition Advocacy staff to act as commenters. The steps of the kit cycle process, began with an initial visit to Warner Robins ALC. The IDEF<sub>0</sub> Manual describes the kit cycle process as follows:

1. The author assembles the material to be reviewed into a Standard Kit. A cover sheet is completed. Copies of the kit are distributed to each of the commenters, and to the author. The original is filed for reference.
2. Within the response time specified, the commenter reads the kit and writes comments directly on the copy. The kit is returned to the author.
3. The author responds in writing directly on each commenter's copy. The author may agree with the comment, noting it on his working copy, and incorporating it into the next version of the model. If there is disagreement, the author notes the disagreement on the kit and returns it to the commenter.
4. The commenter reads the author's responses and, if satisfied, files the kit. (Commented Kits are always retained by the commenter.) If the commenter does not agree with the author's responses, a meeting is arranged with the author to resolve differences. If this cannot be done, a list of issues is taken to appropriate authority for decision [53: Sec V, 2].

The kit cycle continues until author and commenters have considered and contributed to the final model. Figure 3-7 illustrates the kit cycle.

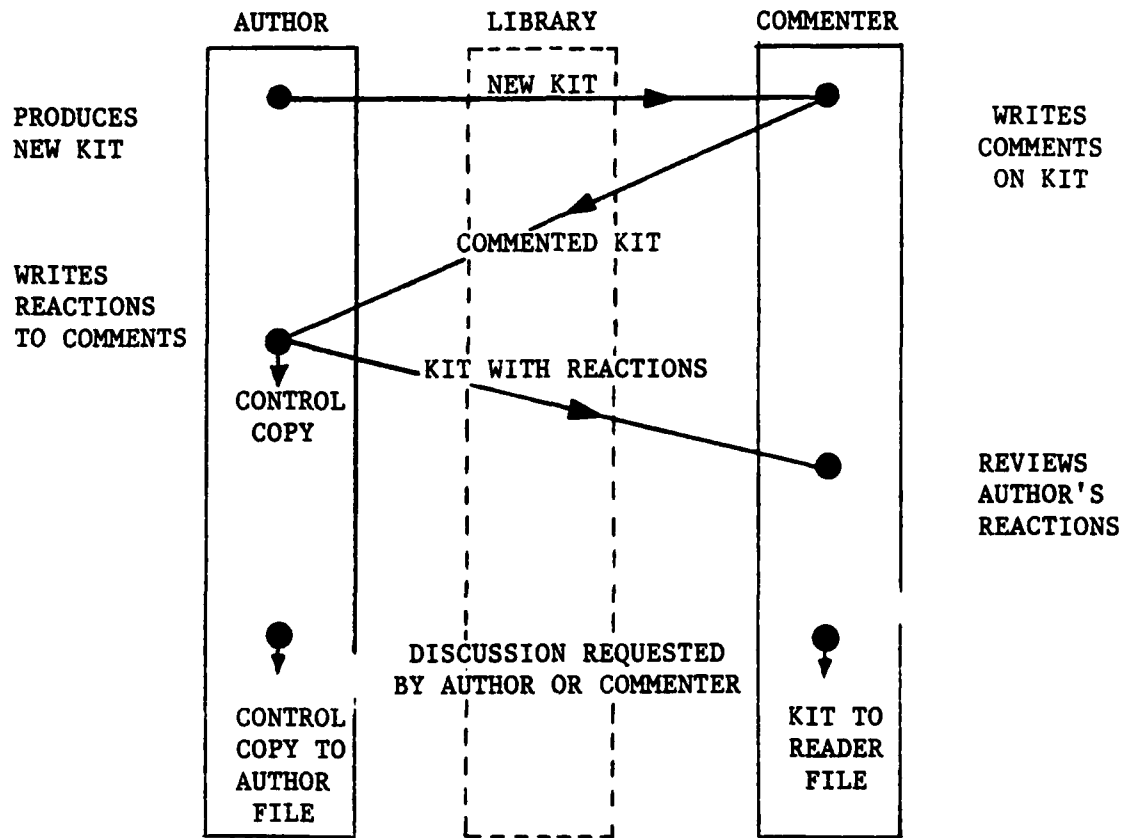


Figure 3-7. IDEF Kit Cycle [53: Sec V, 3]

In conducting the kit cycle the authors expedited the data gathering process by conducting personal interviews with all commenters and reviewers. After the first iteration of the kit cycle, each commenter was given a copy of the kit to review. Two weeks later the authors returned to Warner Robins ALC to integrate the commenters suggestions, and conducted a third iteration of the cycle (32;43;56;57).

A final review of the completed kit was performed by the HQ AFLC Competition Advocate staff. Also, the IDEF<sub>0</sub> diagrams were reviewed by the ICAM Project Manager for the USAF Manufacturing Technology Program to ensure that all diagrams conformed to IDEF<sub>0</sub> requirements (58).

### Analysis

Through the iterative process of IDEF<sub>0</sub>, the model of the activities and relationships within the Directorate of Competition Advocacy was developed and validated. The analysis consists of the narrative description of each functional view, and provides a "picture" of each function to synthesize the answers to the research questions. The diagrams and accompanying narrative definitions also provide a basis for future research.

### Summary

This chapter presented the research methodology used to answer the investigative questions. The literature review, and structured analysis modeling were discussed as the primary methods used in this research effort. A detailed background discussion of the IDEF<sub>0</sub> process described how the Competition Advocacy model was constructed. Additionally, IDEF<sub>0</sub> diagrams were presented to further the understanding of the model. The next chapter describes the research findings and presents the IDEF<sub>0</sub> model of a Directorate of Competition Advocacy.

#### IV. Analysis and Findings

##### Introduction

Chapter III discussed the research methodology used to describe the functional processes of the Directorate of Competition Advocacy. Because this research effort is descriptive in nature, the findings are presented both in text and diagrams. The presentation begins with a description of the entire IDEF<sub>0</sub> model in text format. This description is followed by the IDEF<sub>0</sub> model which presents the Competition Advocacy functions in a structured analysis format. Each diagram of the IDEF<sub>0</sub> model has associated text to describe the inputs, controls, outputs, and functions shown on the diagram.

##### Model Context

The context of the model, Enhancing the Role of Competition, is a complex process. It includes maximizing competition by direct purchase from actual manufacturers, reducing the price of spare parts through price appraisal, developing "target prices" for items with potential pricing problems, and reestablishing credibility as stewards of public funds (54). To perform this function, the Competition Advocate receives inputs from many sources. Challenges to prices of spare parts include; inquiries from legislators, inputs from the field through the Air Force's Zero Overpricing Program, and reports which appear in the news. The current and future requirements for spare parts generates the ongoing task of ensuring the maximum use of competition. These tasks are constrained and controlled by existing contracts, numerous regulations and laws, and the availability of data

that adequately describes and defines an item for purchase.

A chronological perspective was used to describe the function, Enhance the Role of Competition. Correcting past deficiencies improves current acquisition procedures, produces valuable data for future acquisitions, and improves public confidence through the recovery of funds from defense contractors. Improved acquisition data and the lessons learned from past problems enable the Competition Advocate to increase the competitiveness of the current acquisition environment. To ensure that the gains from these efforts continue into the future, a constant process of updating acquisition data is essential. Further, improved policies and procedures as well as organizational development must be achieved to institutionalize the benefits of competition in providing logistics support to the Air Force.

Correcting Past Deficiencies. To correct past deficiencies, the Directorate of Competition Advocacy investigates overpricing challenges, screens acquisition method codes (AMC), and obtains engineering data and the necessary rights to such data. The investigation of overpricing cases is a process which determines if the price paid for a part is reasonable and appropriate to the value of the item. When it is determined that the AMC is inappropriate or that AMC data is incomplete, an information requirement is generated which initiates the AMC screening process. The processes of screening and acquiring data enable the Competition Advocate to update the database and provide essential data for requirements determination and purchasing. Acquisition method code screening may be limited by the availability of engineering or acquisition data. Missing data must be acquired to complete the screening



and/or overpricing investigation processes. The lack of data, engineering data in particular, is a significant barrier to making competitive acquisitions. It was noted during the development of the model that over 10,000 items lacked complete data. Further, the legal constraints on the use of proprietary data limits the use of such data in competitive buys.

Achieving Competition in Current Acquisitions. In terms of current operations the Directorate of Competition Advocacy is directly involved in the acquisition process. Before a buy is made on a non-competitive basis, the Competition Advocate reviews acquisition data packages generated in the Directorate of Material Management. Available data is compared with the stated requirement in a process to produce a fully documented purchase package. When a valid sole-source requirement is received, the Price Analysis Division of the Directorate develops a target price which assists the buyers in the Directorate of Contracting and Manufacturing in the negotiation process. When the data is insufficient to develop a target, the Engineering Data Management Division obtains the required data through a data search, purchase, or reverse engineering. In performing these functions, directorate personnel handle large amounts of data which must be managed to ensure timely processing of information and accurate update of the acquisition database. Additionally, the Directorate provides support to customer requests for assistance and responds to competitor complaints. Other directorates may require assistance in performing site surveys, determining adequacy of data, or providing information to potential new bidders. When a bidder complains of disqualification from the competitive

process, the Source Development Office of the Directorate will investigate and provide the potential competitor with suggested actions to enable him/her to compete in the future.

Enhance Future Competition. To increase competition in future acquisitions, the Competition Advocate evaluates forecasted needs to determine the market areas where source development is required. By developing competitive sources for future acquisitions, the Competition Advocacy function ensures that competitive sources will be available during the life cycle of future weapon systems. It also eliminates the need to search historical data to verify that overpricing did not occur. A fundamental benefit of including competition considerations in the planning process is that it puts the buyer "on notice" that competition is the way of conducting business in the marketplace. The Competition Advocate also participates in Configuration Control Boards to insure that competition is considered in product design changes as systems are being modified. A significant contribution to future competition is achieved through the spare parts breakout process. By identifying the actual producer of an item, the Source Development Office, identifies and qualifies new sources which are added to the acquisition database.

#### IDEF<sub>0</sub> Model of a Directorate of Competition Advocacy

The following diagrams, text, and glossaries represent a Structured Analysis model of the Directorate of Competition Advocacy at an Air Logistics Center. The first four diagrams represent the node tree and illustrate the overall model relationships (Figures 4-2

through 4-5). The node tree is followed by the node index which is a listing of the model diagrams in table of contents format (Table I). The IDEF<sub>0</sub> diagrams are then presented in page pair format (Figure 4-1). The detail diagram is presented opposite its explanation in text form. A glossary of terms used in the diagrams is provided with the text. The interpretation and definition of many of the terms and diagram labels were extracted from a recent study conducted jointly by the Competition Advocacy staffs of the Warner Robins and Ogden ALC's (59). To maintain a point of reference for the reader, the parent diagram is shown in the upper right of the text page.

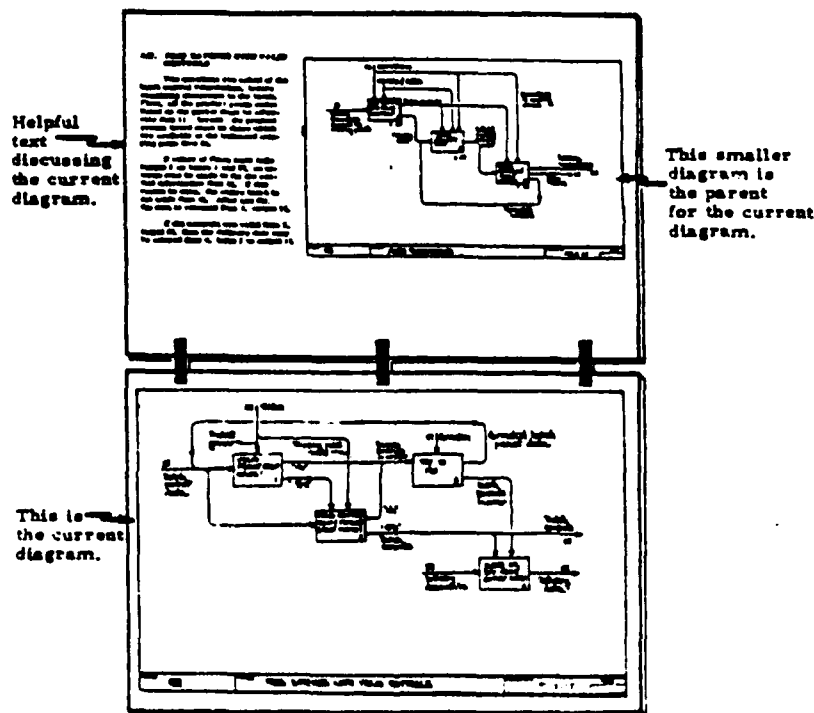


Figure 4-1. Page-Pair Format [53: Sec IV, 1]

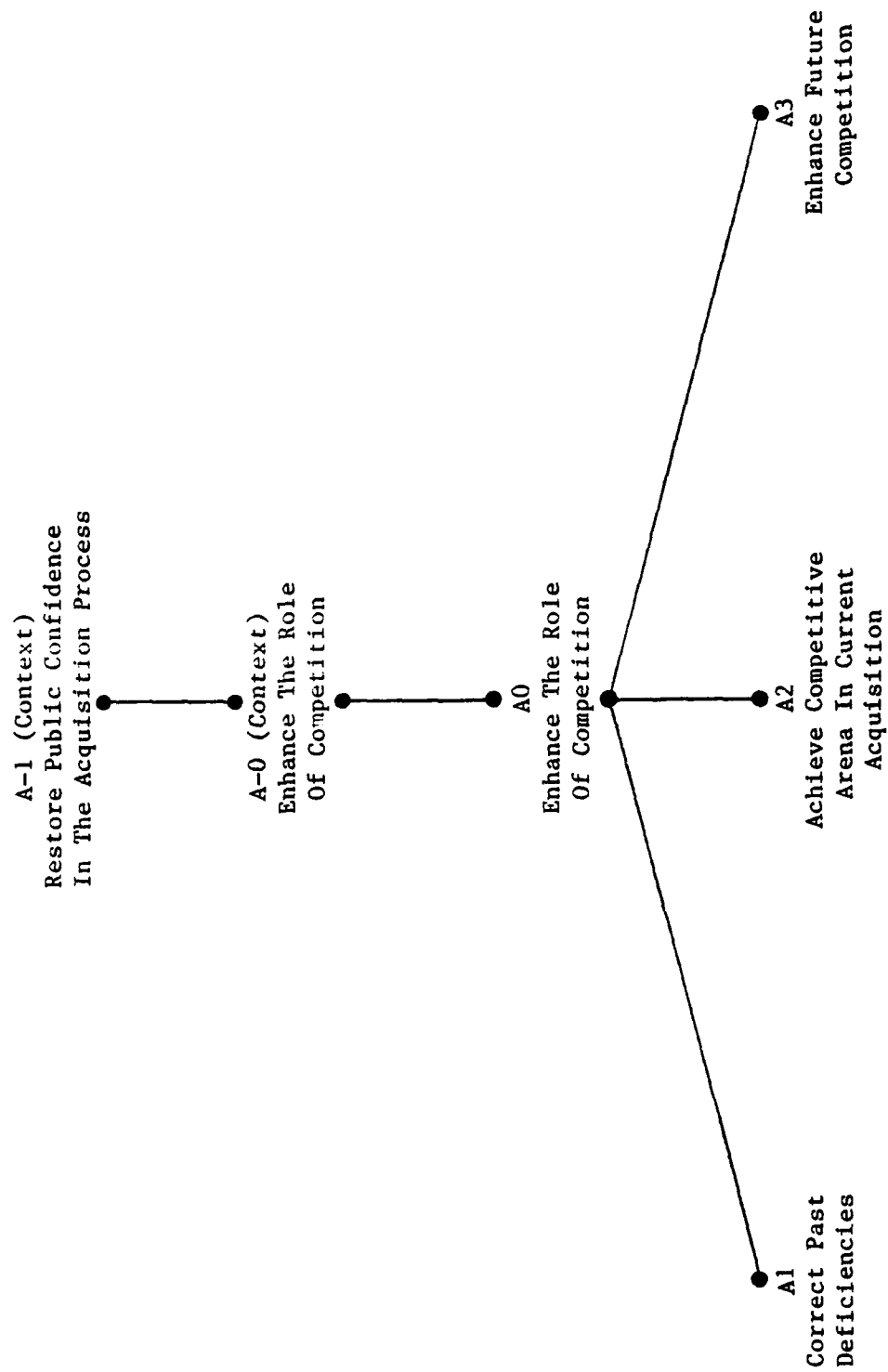


Figure 4-2. Competition Advocate Node Tree - I

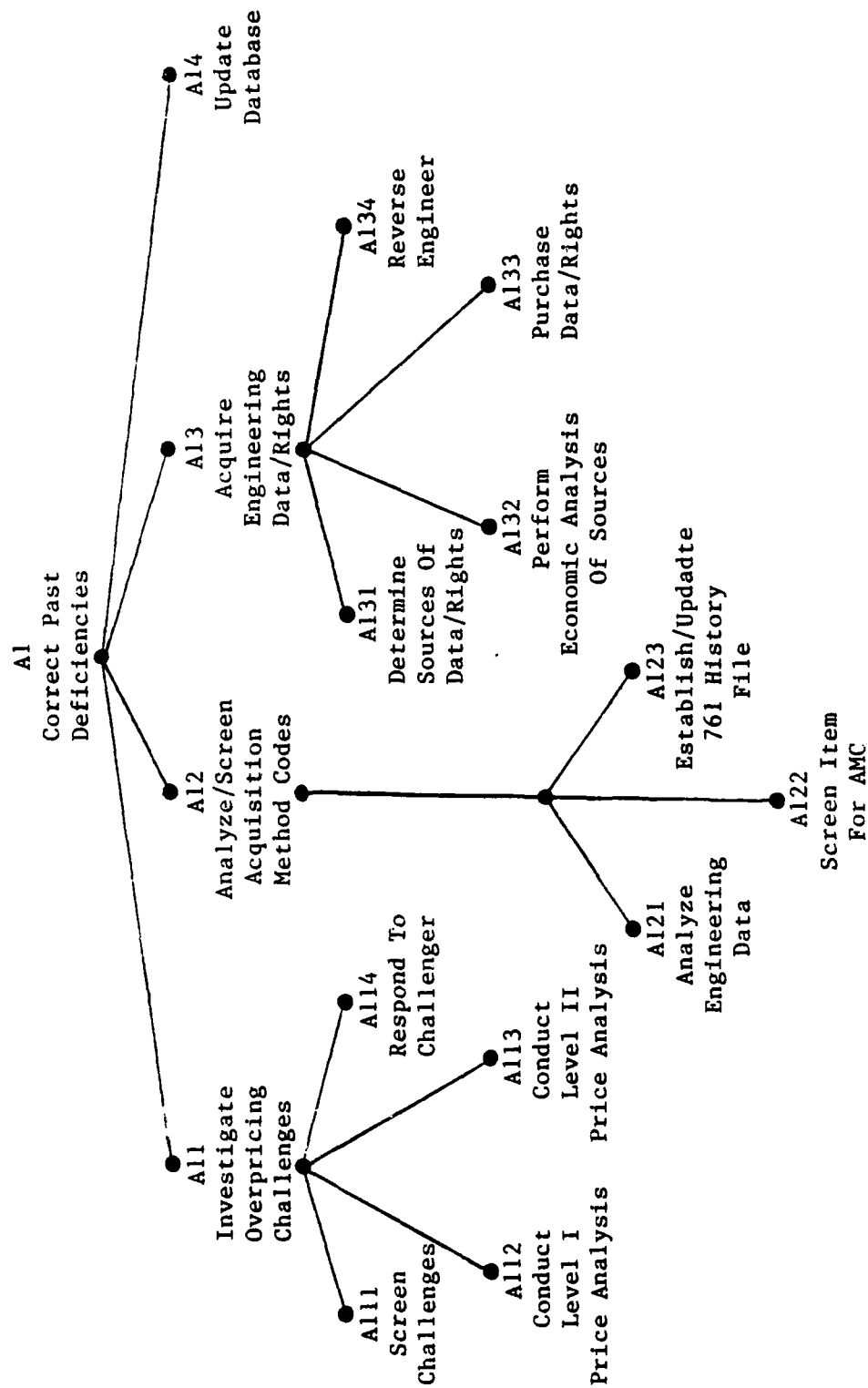


Figure 4-3. Competition Advocate Node Tree - II

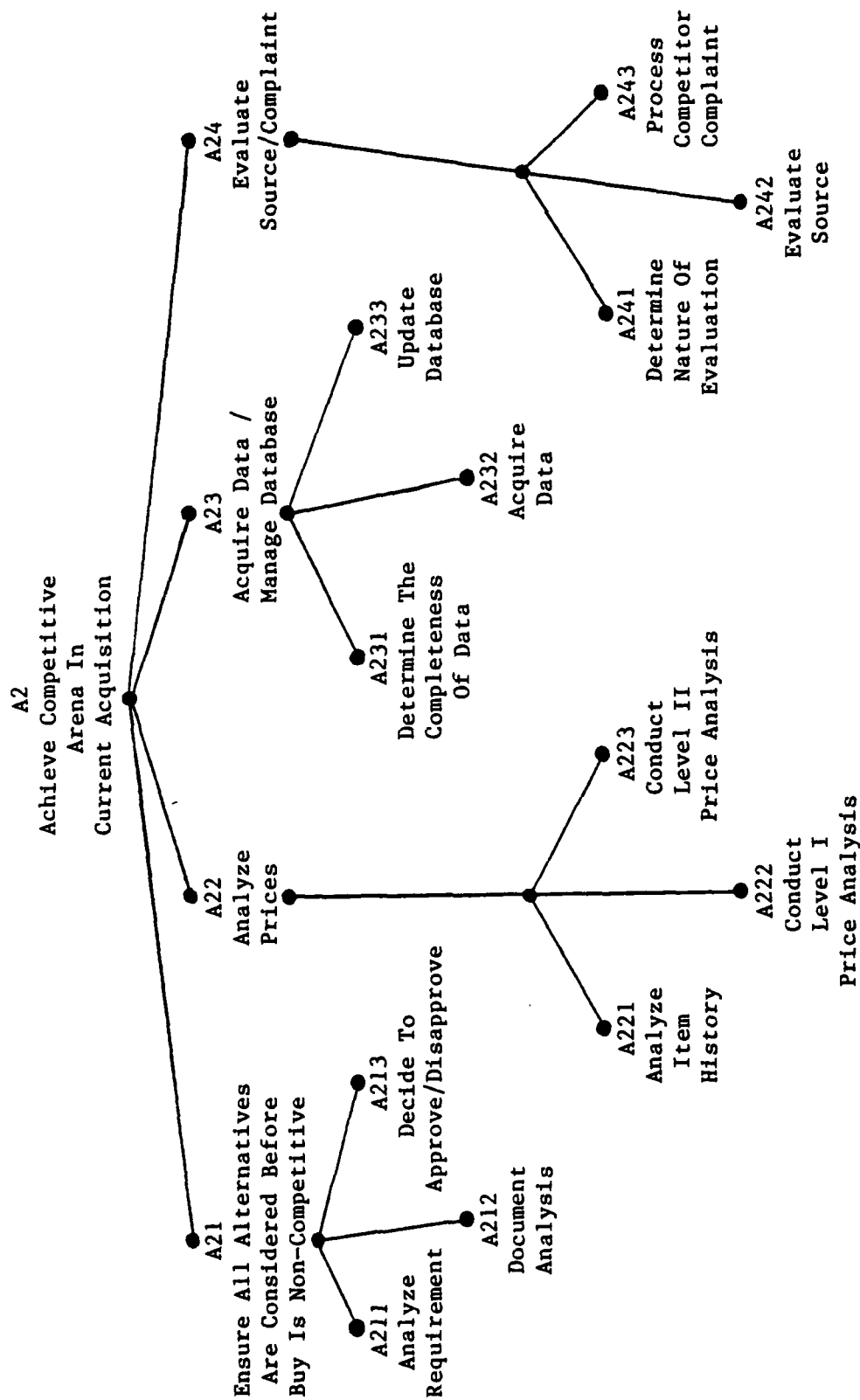


Figure 4-4. Competition Advocate Node Tree - III

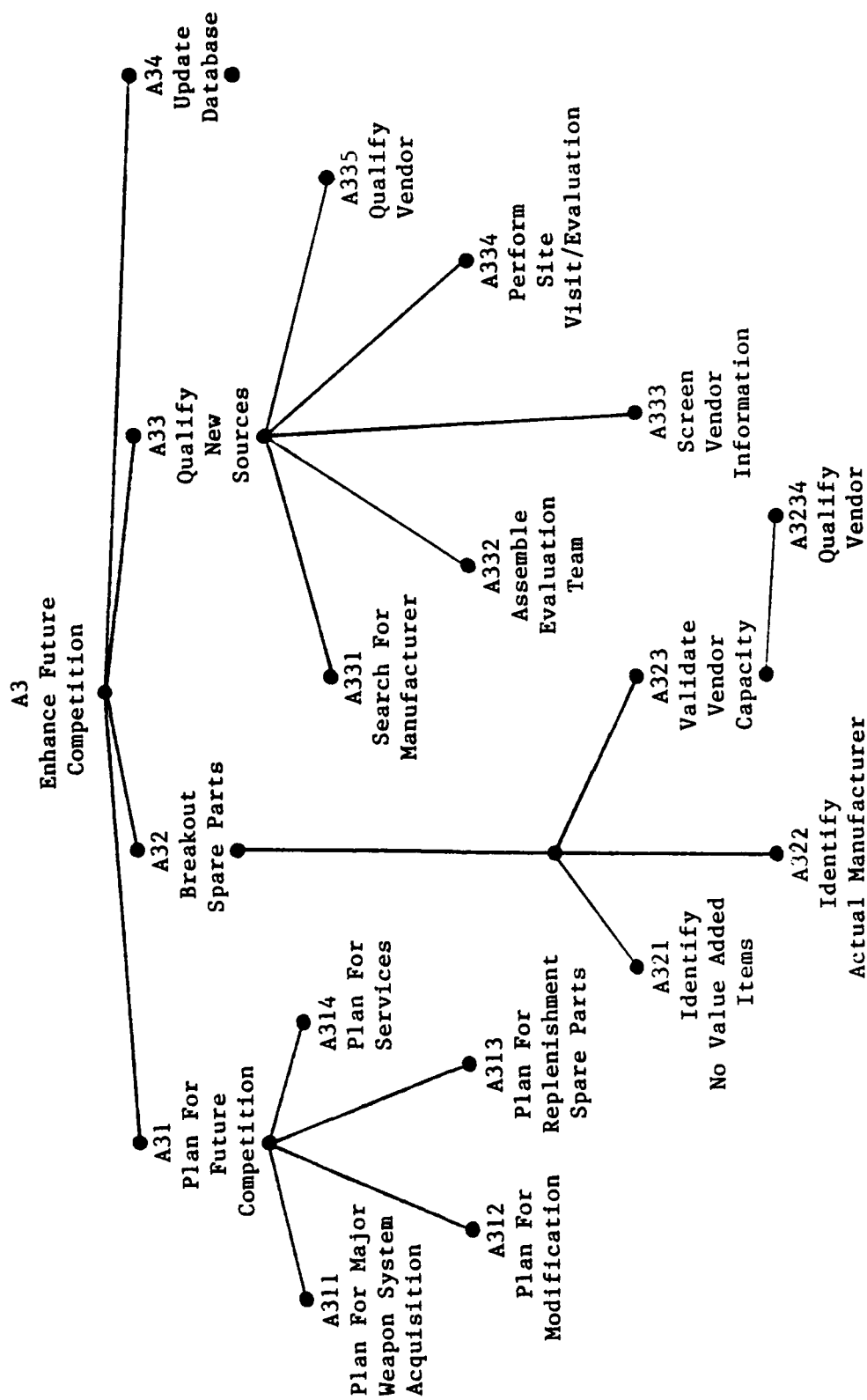


Figure 4-5. Competition Advocate Node Tree - IV

TABLE I  
Node Index - CR<sub>0</sub>

Title	Page
A-0 Enhance the Role of Competition (Context) . . . . .	78
A0 Enhance the Role of Competition . . . . .	80
A1 Correct Past Deficiencies . . . . .	82
A11 Investigate Overpricing Challenges . . . . .	86
A111 Screen Challenges . . . . .	88
A112 Conduct Level I Price Analysis . . . . .	90
A113 Conduct Level II Price Analysis . . . . .	92
A114 Respond to Challenger . . . . .	96
A12 Analyze/Screen Acquisition Method Codes . . . . .	98
A121 Analyze Engineering Data . . . . .	100
A122 Screen Item for AMC . . . . .	102
A123 Establish/Update 761 History File . . . . .	104
A13 Acquire Engineering Data/Rights . . . . .	106
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A132 Perform Economic Analysis of Sources . . . . .	110
A133 Purchase Data/Rights . . . . .	112
A134 Reverse Engineer . . . . .	114
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A2 Achieve Competitive Arena in Current Acquisition . . .	118
A21 Ensure All Alternatives are Considered Before Buy is Non-Competitive . . . . .	120
A211 Analyze Requirement . . . . .	122
A212 Document Analysis . . . . .	124



Table I (Continued)

Title	Page
A213 Decide to Approve/Disapprove AMC . . . . .	126
A22 Analyze Prices . . . . .	128
A221 Analyze Item History . . . . .	130
A222 Conduct Level I Price Analysis . . . . .	132
A223 Conduct Level II Price Analysis . . . . .	134
A23 Acquire Data/Manage Database . . . . .	136
A231 Determine the Completeness of Data . . . . .	138
A232 Acquire Data . . . . .	140
A233 Update Database . . . . .	142
A24 Evaluate Source/Complaint . . . . .	144
A241 Determine Nature of Evaluation . . . . .	146
A242 Evaluate Source . . . . .	148
A243 Process Competitor Complaint . . . . .	150
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A311 Plan For Major Weapon System Acquisition . . . . .	156
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A314 Plan For Services . . . . .	162
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A323 Validate Vendor Capacity . . . . .	170

Table I (Continued)

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A331 Search For Manufacturer . . . . .	176
A332 Assemble Evaluation Team . . . . .	178
A333 Screen Vendor Information . . . . .	180
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#### A-0 Enhance the Role of Competition

This function is the overall context of the main model. Enhancing the role of competition takes inputs from various sources and produces outputs which correct past deficiencies, improves current acquisition, and enhances future opportunities for competition. Controls and constraints limit as well as facilitate accomplishment of this function.

To unclutter the subsequent diagrams, the regulations, laws, and marketplace arrows are not shown on all diagrams. The parenthesis at the arrowhead shows this implicit existence. When needed for clarification, specific arrows will be tunneled into some subsequent diagrams.

#### Glossary

Challenges - Challenges to the price of an item are received from Congressional inquiries, the Zero Overpricing program, and/or

media publicity.

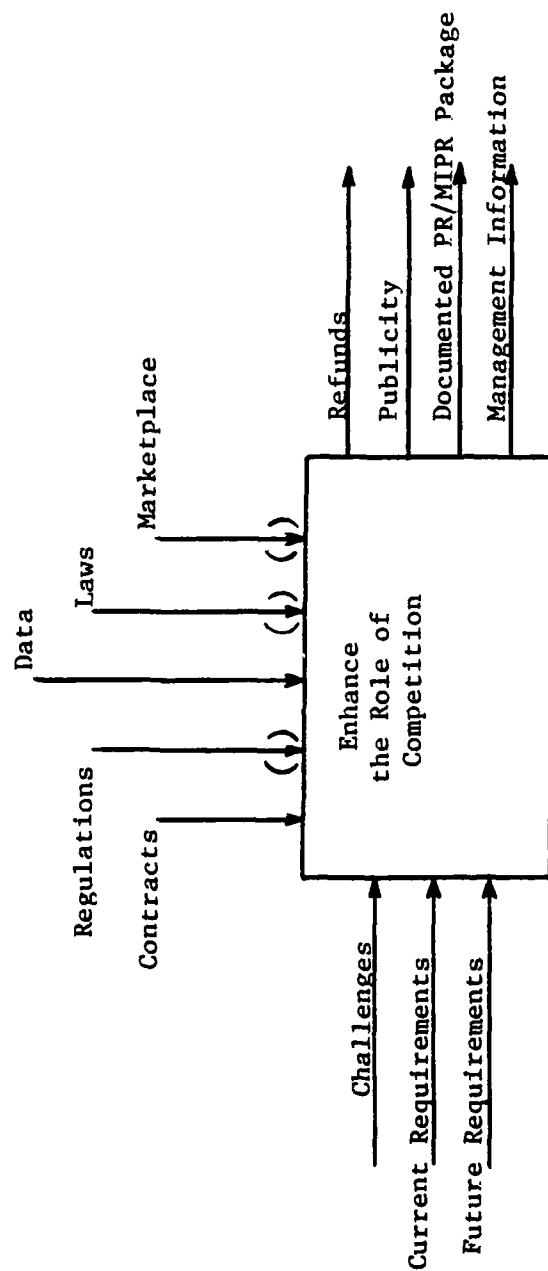
Regulations - Policy and procedures are spelled out for each major function, from the Federal Acquisition Regulation through DOD Directives, Air Force Regulations, AFLC Regulations, to ALC and Directorate Regulations and Operating Instructions.

Laws - These include contract law, acquisition laws, and such statutes that control the acquisition process. Compliance with the law is an implicit part of acquisition.

Marketplace - The composite of all factors which define the environment in which spare parts are purchased to support fielded weapon systems.

Documented PR/MIPR Package - A complete "Purchase Request/Military Interdepartmental Purchase Re-

quest." These forms are used to acquire supplies, services, and data.



Purpose: To provide an understandable model of the Competition Advocacy Program which reflects the major functions of the Competition Advocacy process.

Viewpoint: Air Logistics Center Directorate of Competition Advocacy

NODE: CR/A-0	TITLE: Enhance the Role of Competition (Context)	NUMBER:
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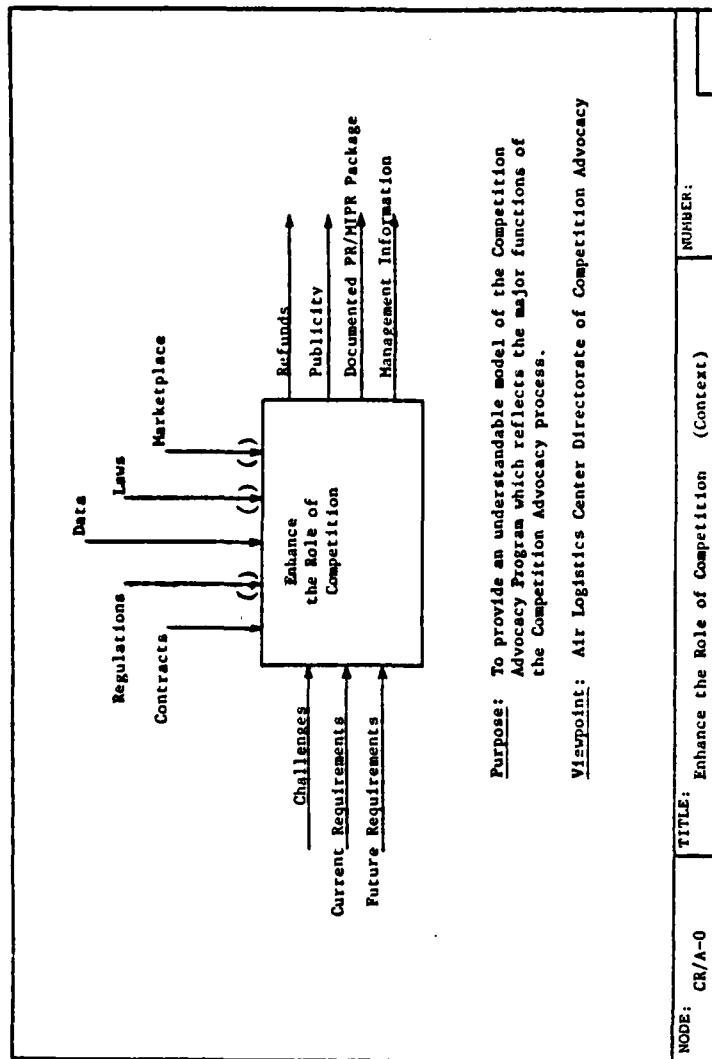
## A0 Enhance the Role of Competition

Enhancing the role of competition includes correcting past deficiencies, achieving a competitive arena for current acquisition, and enhancing future competition. These major functions are interrelated since each can help provide an improved database for acquisition.

### Glossary

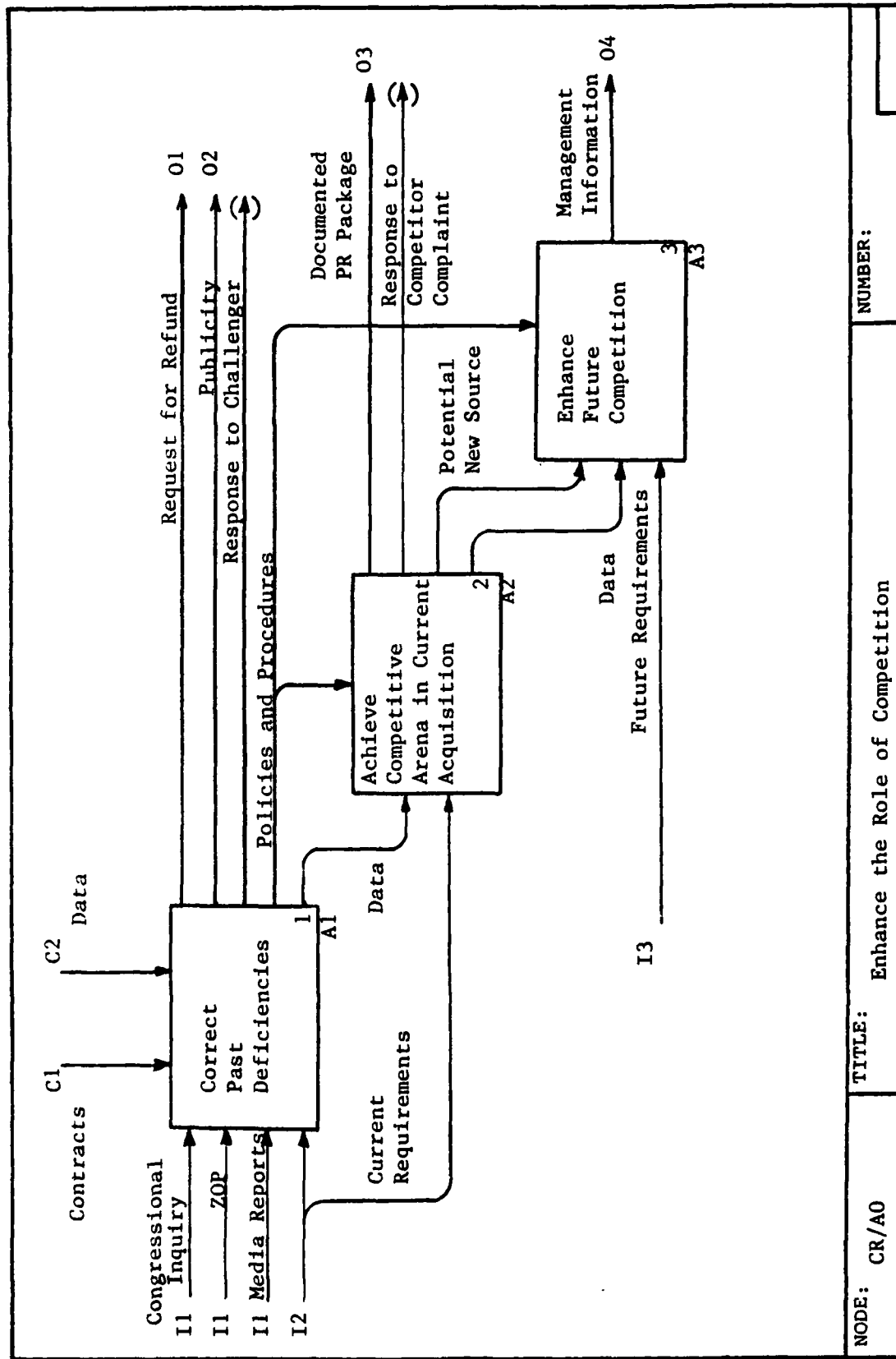
**Requirements** - Material, supplies, equipment, and services which must be acquired to provide logistics support to the operational and support commands of the Air Force and other services.

**ZOP - Zero Overpricing Program** - The Zero Overpricing Program was established to ensure that the Air Force did not pay more than a fair market price for contractor supplied items. The program encourages end item users in the field to challenge prices which appear to be



unreasonable, and rewards challengers when significant savings to the Government are achieved.

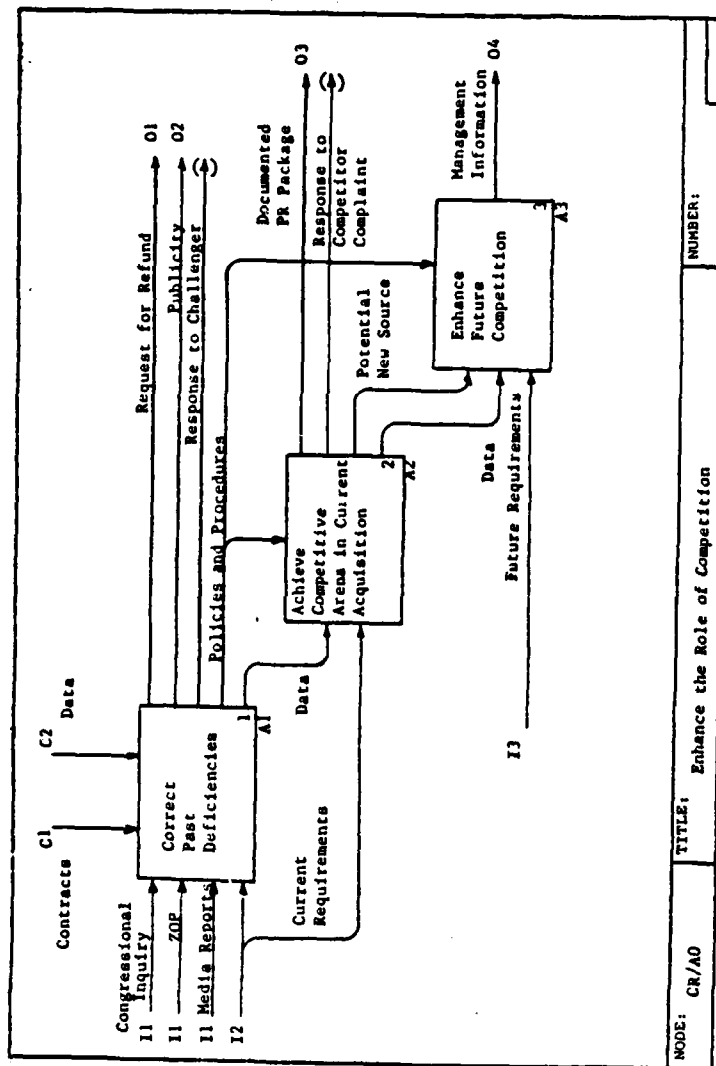
**Data** - Data includes those elements of management information which may contain engineering drawings, specifications, acquisition histories, contractor information, and other data elements



## A1 Correct Past Deficiencies

Deficiencies in previous purchases have been discovered through Congressional inquiry, the Zero Over Pricing program, or media reports. If the necessary information to investigate an overpricing challenge is available, a response to the challenger is prepared. The investigation of an overpricing challenge then results in: refund request to the seller, publicity for the buying activity (favorable or unfavorable), and improved policies and procedures for future buys.

An investigation of overpricing challenges can also result in a need for further information. Required information can be obtained from Acquisition Method Code screening and the acquisition of engineering data/rights. Once the missing data is obtained, the acquisition database can be updated to enhance future buys.

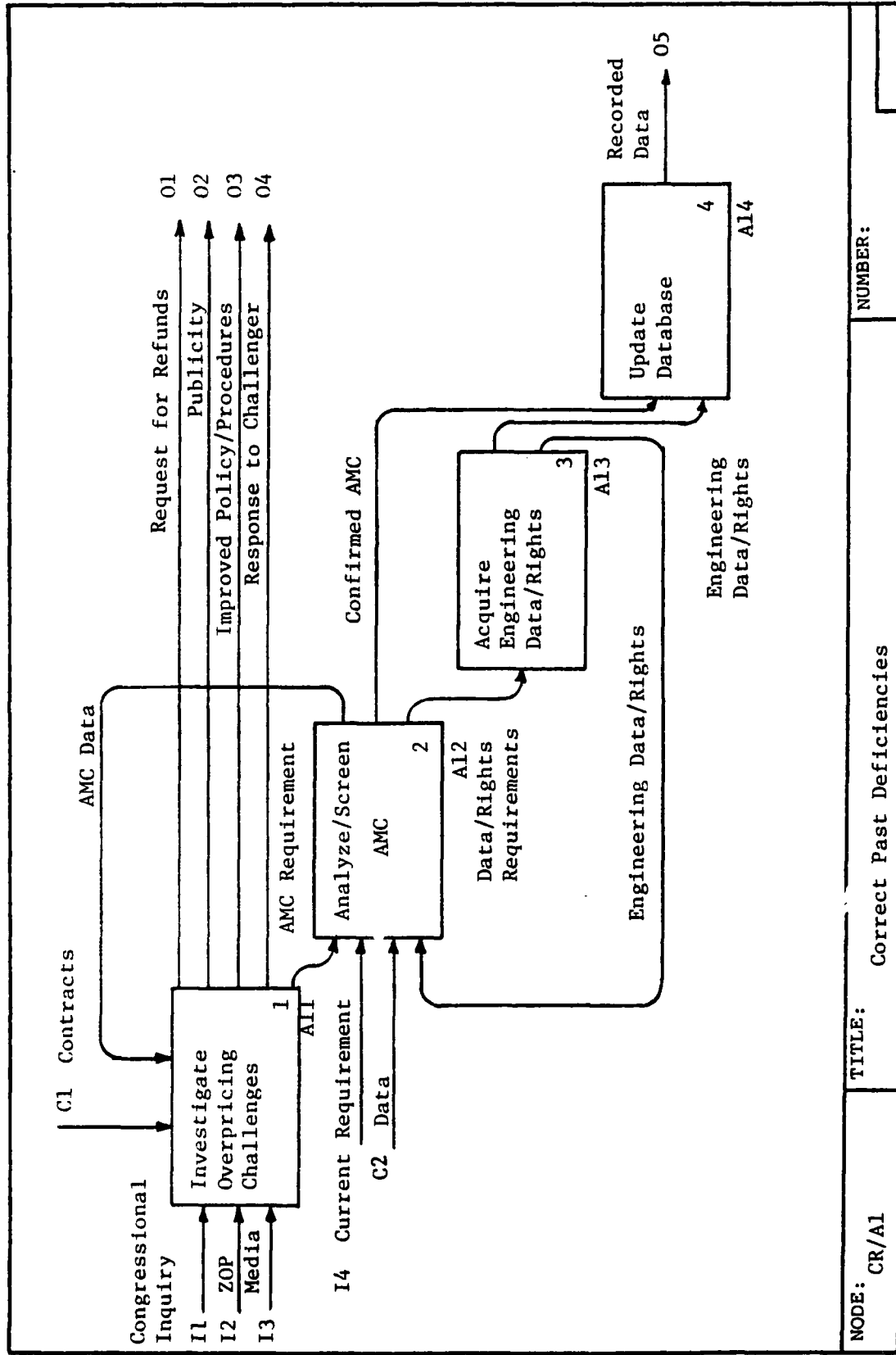


## Glossary

AMC - Acquisition Method Code is a two character (alpha-numeric) to identify the method of acquisition.

Analyze and Screen AMC - Acquisition method code screening is a review process whereby an item, for purchase, is evaluated to

determine the appropriate method for acquisition. The acquisition method can take the form of a competitive or non-competitive purchase in the marketplace. But, due to time, performance, or supportability requirements, an exception may be made to this policy. AMC screening is conducted in





AI Glossary (con't)

accordance with Supplement 6 of the DOD Supplement to the Federal Acquisition Regulation.

ZOP Challenge - A Zero Overpricing Challenge is a challenge of the current stock-list price submitted from any source in accordance with AFR 400-17.

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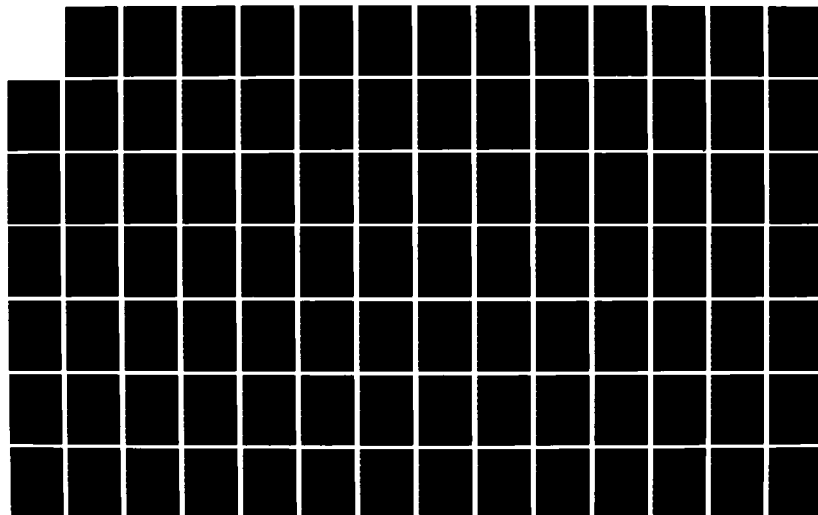
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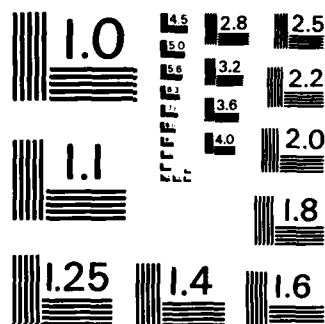
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NATIONAL BUREAU OF STANDARDS-1963-A

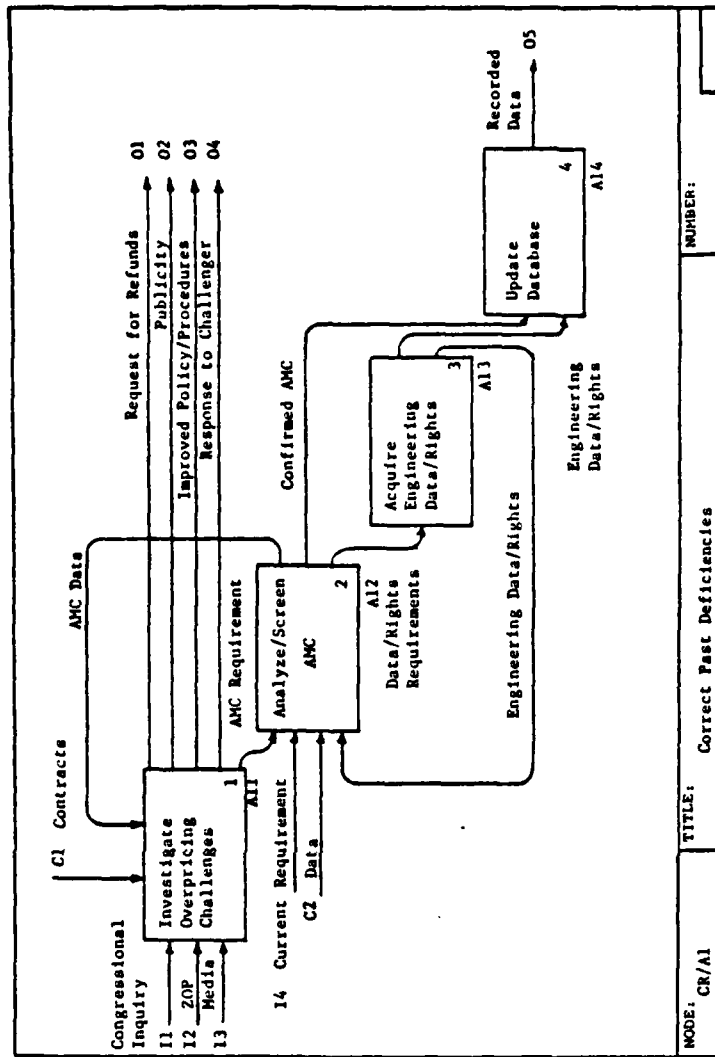
## All Investigate Overpricing Challenges

The investigation of an overpricing challenge is screened for proper format and the completeness of required information. A challenge that lacks all necessary information is returned to the originator for more information. Once the complete data package is assembled, a level I price analysis is conducted. If the price is valid, a response is sent to the challenger, and updated data is entered into the database. When the level I price analysis indicates an overpricing for the item, a level II price analysis is conducted. Competitive buys more than five years old are considered for level II price analysis in all cases. Recent competitive buys, (less than five years), are assumed to have had an appropriate price established by the marketplace.

### Glossary

Level I Price Analysis - An

Level II Price Analysis - A level II price analysis is

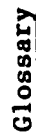


analysis to determine if the last contract price was fair and reasonable. This decision is based upon a knowledge of the intrinsic value of the item, comparison to similar items, and past acquisitions.

an in-depth analysis of the item's price and is conducted by a team of experts in various disciplines including: engineering, labor, material, and packaging. The result of a level II price analysis is a target price that may or may not result in a lowering of the price paid for an item.

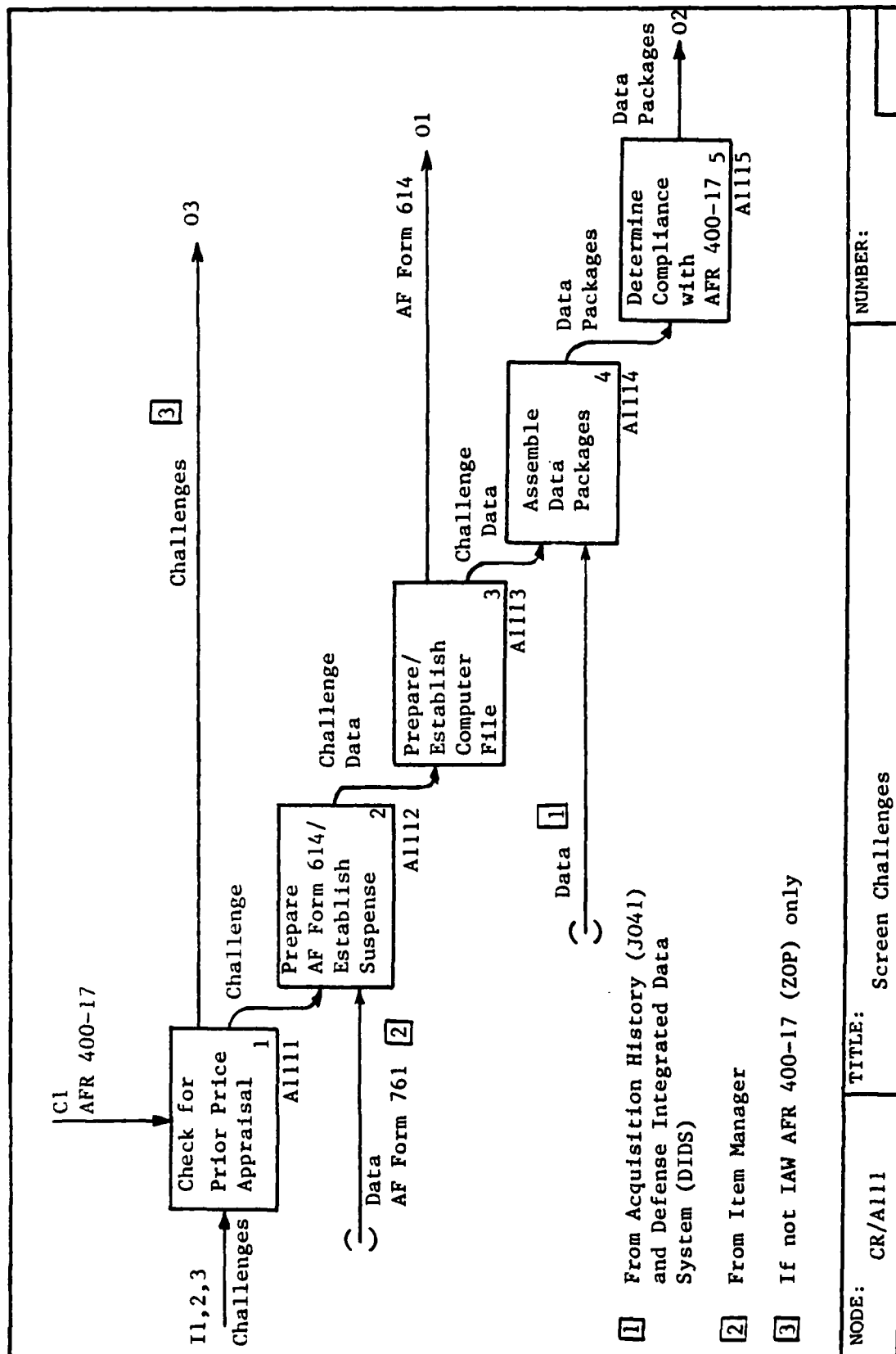


Challenges are screened to ensure that an adequate data package can be produced. For Zero Overpricing Program challenges, a screening is conducted to determine if the challenge meets the requirements of AFR 400-17, Zero Overpricing Program. ZOP challenges may be returned to the originator when adequate information or item descriptions are not included in the challenge. In the past, stringent application of AFR 400-17 requirements has limited the effectiveness of the program. Efforts at the WR-ALC/CR to expand the responsiveness of the program has reduced the number of returned challenges. All challenges initiated by Congressional inquiry, media reports, and ZOP are documented, and the appropriate suspense established. From the challenge data, a computer file is established and a data package is prepared to begin the analysis process.



AF Form 614 - Charge Out

**Record-** A document to record the existence of a file and its location.



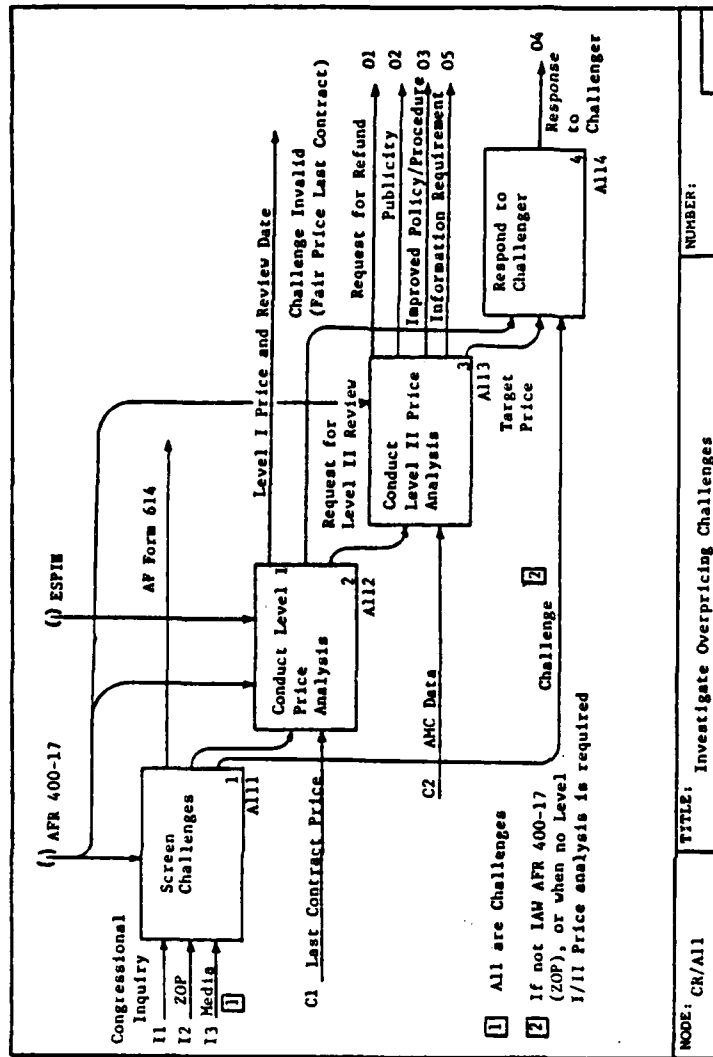


## All12 Conduct Level I Price Analysis

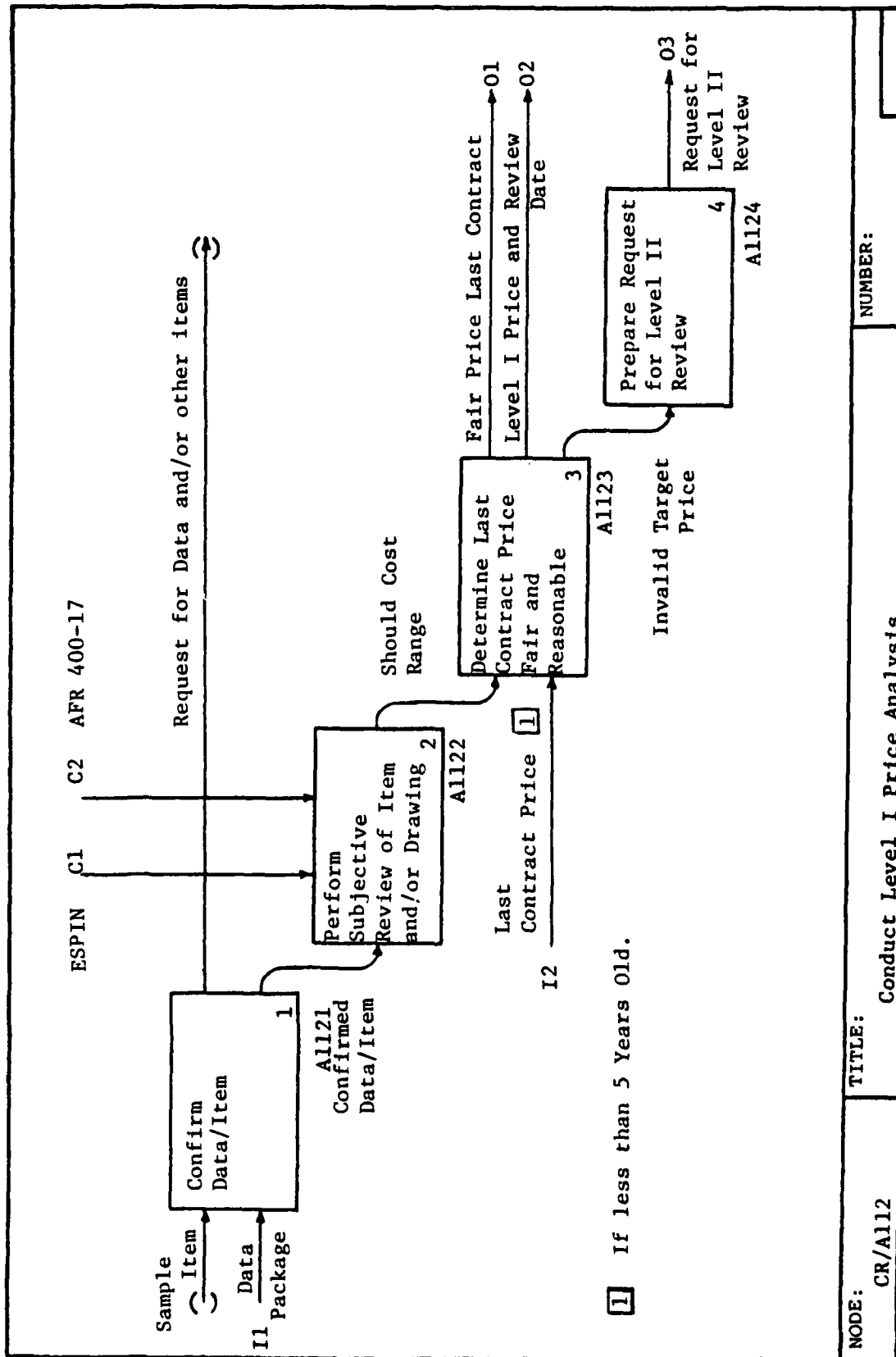
A level I price analysis is initiated by obtaining the engineering data package and a sample item. When the engineering data is incomplete and/or a sample of the item is not available, a request for the missing data/item is submitted to the appropriate system/item management function. Once confirmed, a subjective review of the data package and the item is conducted to determine a "should cost" range. The last price paid for an item and the "should cost" price are compared. If the last price paid is within the "should cost" range, the level I price analysis is complete, and the appropriate databases are updated. A price in excess of the "should cost" range initiates the requirement for a level II price analysis.

## Glossary

ESPIN - Emergency Spare Parts Inventory Network - ESPIN is a program established



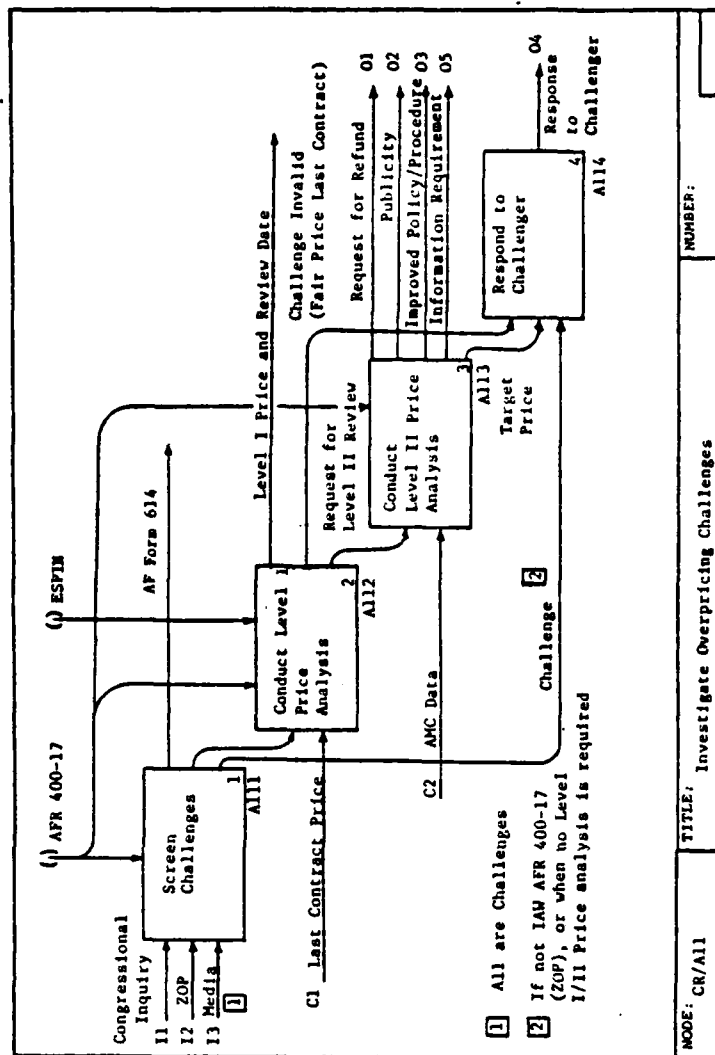
within AFLC to gather and prepare pricing data for rapid response to critical pricing challenges.



### AI13 Conduct Level II Price Analysis

A level II price analysis is initiated as a result of a level I price analysis and uses Acquisition Method Code (AMC) data as an additional information input. The item and data from the level I review are then assigned to packaging, labor, and material specialists. A price estimate is combined with labor hour and material estimates to arrive at a composite estimate for rate application.

The application of rates varies in accordance with the type of labor and material that make up the item. When applying labor and material rates, the average for the particular industry that manufactures the item is used. Often the Defense Contracting Administration Services (DCAS) officer or the Air Force Plant Representative Office (APPRO) is consulted for a particular manufacturer's labor and material rates. If no manufacturer unique rates are available, or



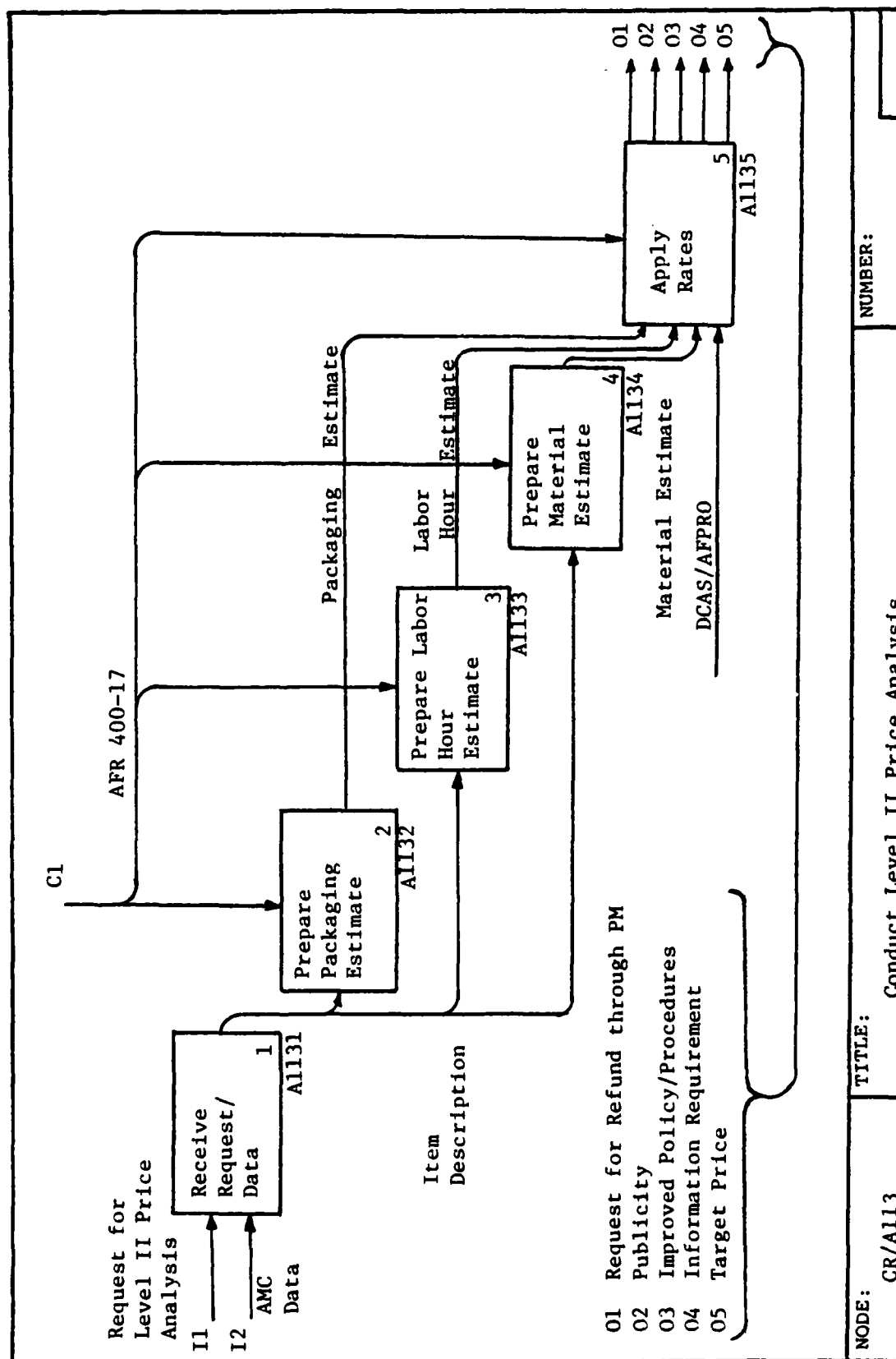
If the company is a small vendor, an industry-wide aggregate rate is applied.

The output of a target price or "should cost" figure can initiate favorable publicity, a change in policy or procedure, a request for refund, or a request for additional information from the price challenger.

### Glossary

Item description - A complete and accurate description of the item in sufficient detail to analyze all cost factors. This will include drawings, engineering specifications, and acquisition data.

Request for Refund - When the



All3 Glossary (con't)

last contract price paid for an item significantly exceeds the target price, a request for recovery of excess funds from the manufacturer is initiated. This request is forwarded to the manufacturer through the directorate of Contracting and Manufacturing.

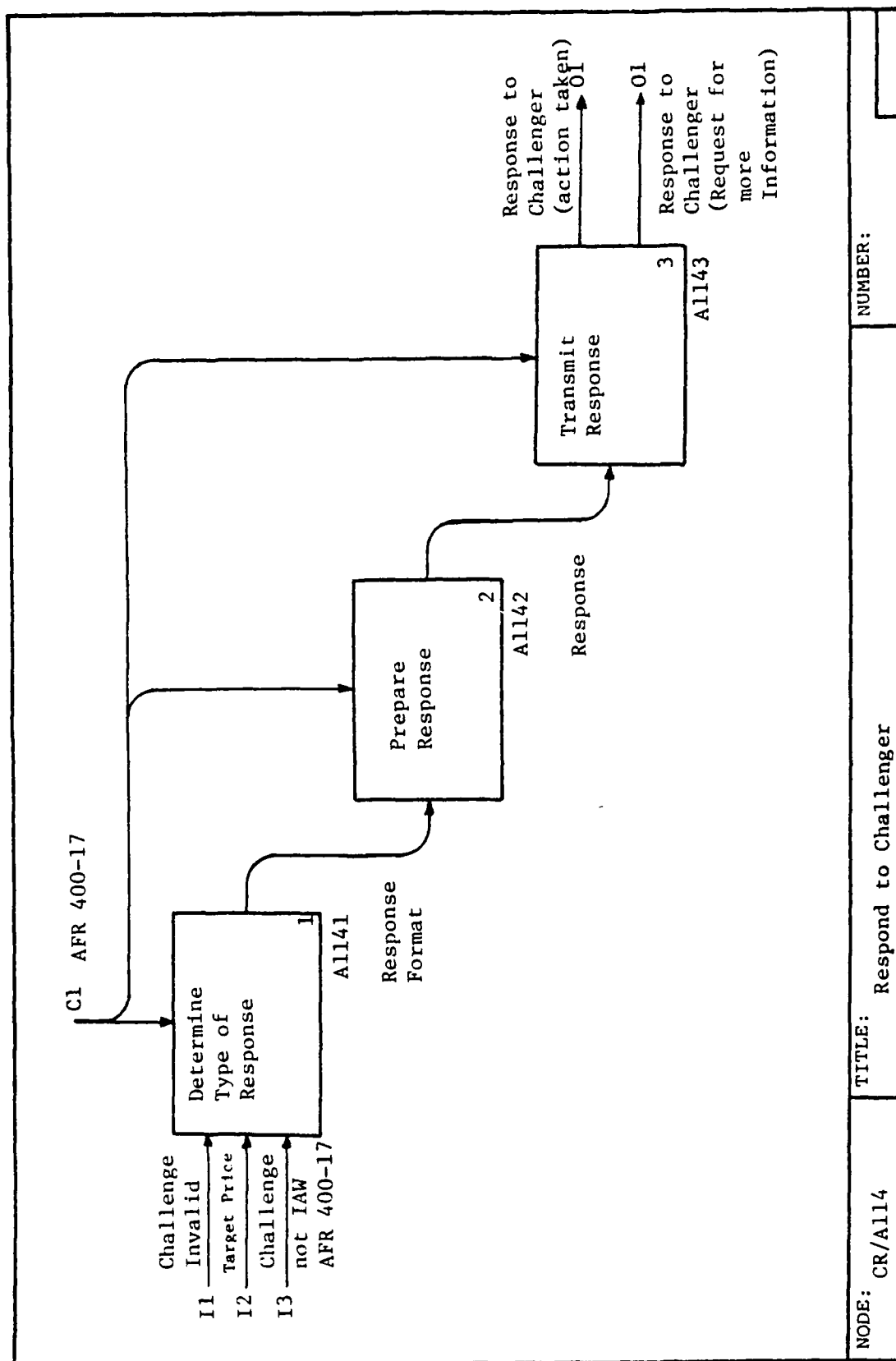
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        C1[Congressional Inquiry] -- 11 --> SC[Screen Challenges]
        C2[ZOP] -- 12 --> SC
        C3[Media] -- 13 --> SC
    end
    SC -- A111 --> CL1[Conduct Level I Price Analysis]
    CL1 -- A112 --> CL2[Conduct Level II Price Analysis]
    CL2 -- A113 --> T[Target Price]
    T -- A114 --> R[Respond to Challenger]
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    C4 --> C335
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    C4 --> C337
```

Replies to the originator are prepared in accordance with the prescribed formats. The response may request more information or provide the challenger with the action taken on the challenge.

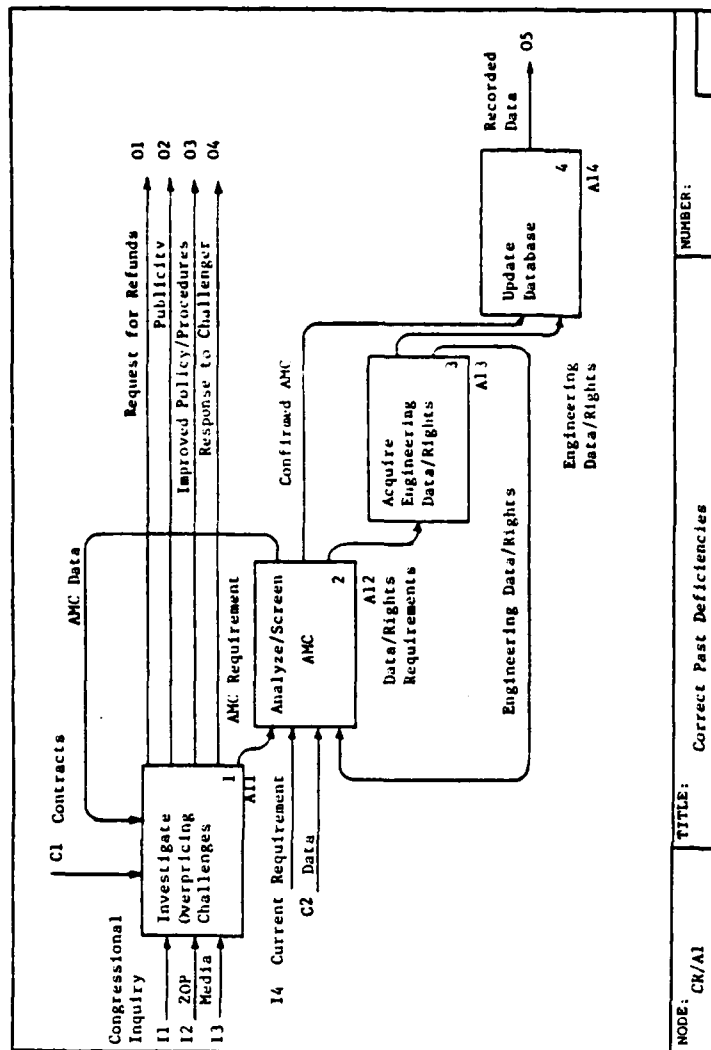
Replies to ZOP challenges are prepared in accordance with AFR 400-17 while ESPIN reports are transmitted via email to ensure timely delivery. In determining the type response, a review is conducted to determine if the challenge is to receive a monetary reward.





## A12 Analyze/Screen Acquisition Method Codes

The process of analysis and screening of Acquisition Method Codes begins with the receipt of a requirement and the screening of engineering data to fulfill that requirement. In preparing for screening, determinations are made based upon screening eligibility, availability of engineering data, proprietary rights requirements, the need for acquisition data, and reverse engineering requirements. When sufficient data is available, the item screening will establish the appropriate acquisition method code. If the AMC is determined to be competitive, the package is routed to the Directorate of Material Management for the system engineer's coordination. When coordination is complete, the screening analysis worksheet (AFLC Form 761) is returned to the CR function where the 761 History File is updated to reflect the revised AMC.

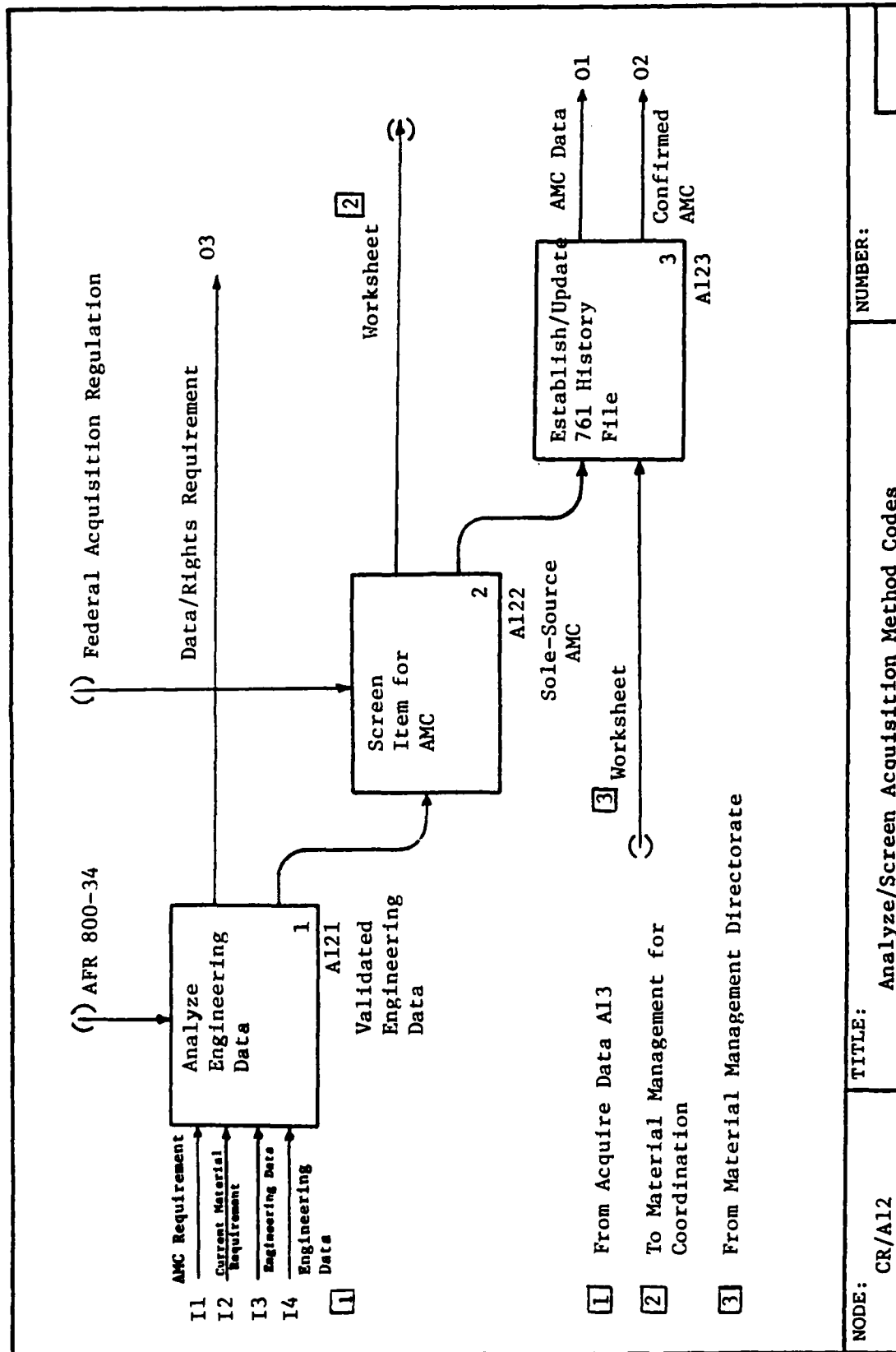


## Glossary

AFLC Form 761, Screening Analysis Worksheet, - A form used for the assignment of the AMC. It specifies the method to be used for acquisition.

761 History File - A file which contains all forms, correspondence, problems

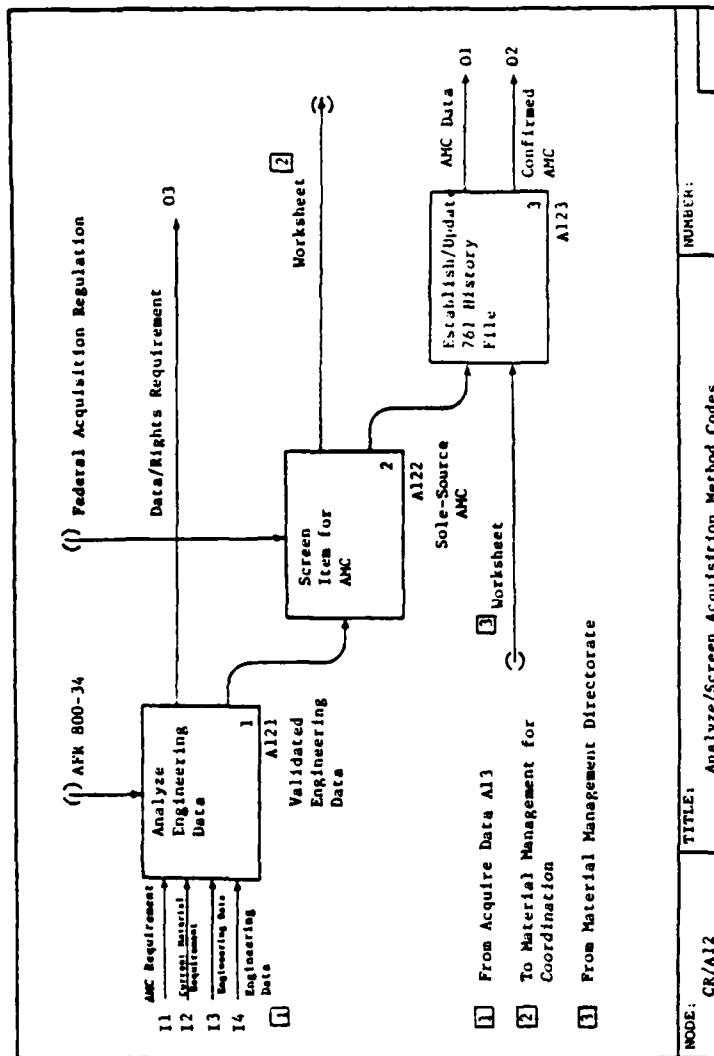
encountered, and other pertinent documentation concerning past and present buys of a specific item by Federal Stock Number.



## AL21 Analyze Engineering Data

The analysis of engineering data considers two sources; engineering data from item records and engineering data from reverse engineering efforts. The analysis starts by assembling all item data. The data is compared with current operational requirements as well as current data requirements. The comparison of what data is available and what data is required may result in an engineering data short-fall. In all cases, whenever data is considered, the rights to that data must also be considered. If the data is available and in the possession of the ALC, it may have proprietary rights attached to it. The ALC will then be required to obtain the rights to use the data.

To complete the engineering data analysis, the analysis worksheet is completed (AFLC Form 761). Any resultant data or proprietary rights shortfalls are docu-



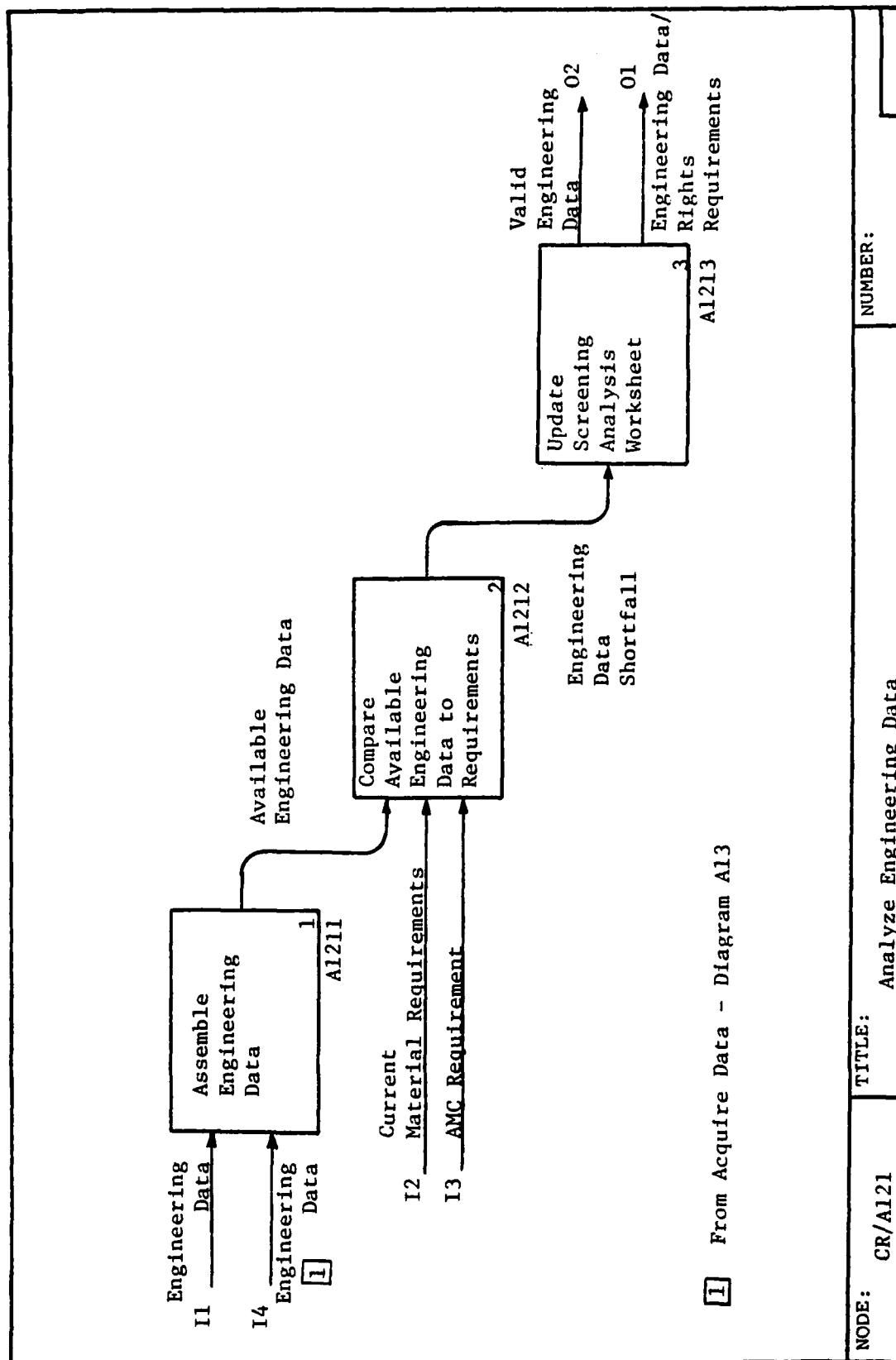
mented on AF Form 1147 (Request for Engineering Data).

drawings for reproduction from microfilm to paper.

## Glossary

AF Form 1147 - Request for

Engineering Data - This form is used to request engineering drawings from ALC/MM-R, AFALC, and other services. It is also used to identify

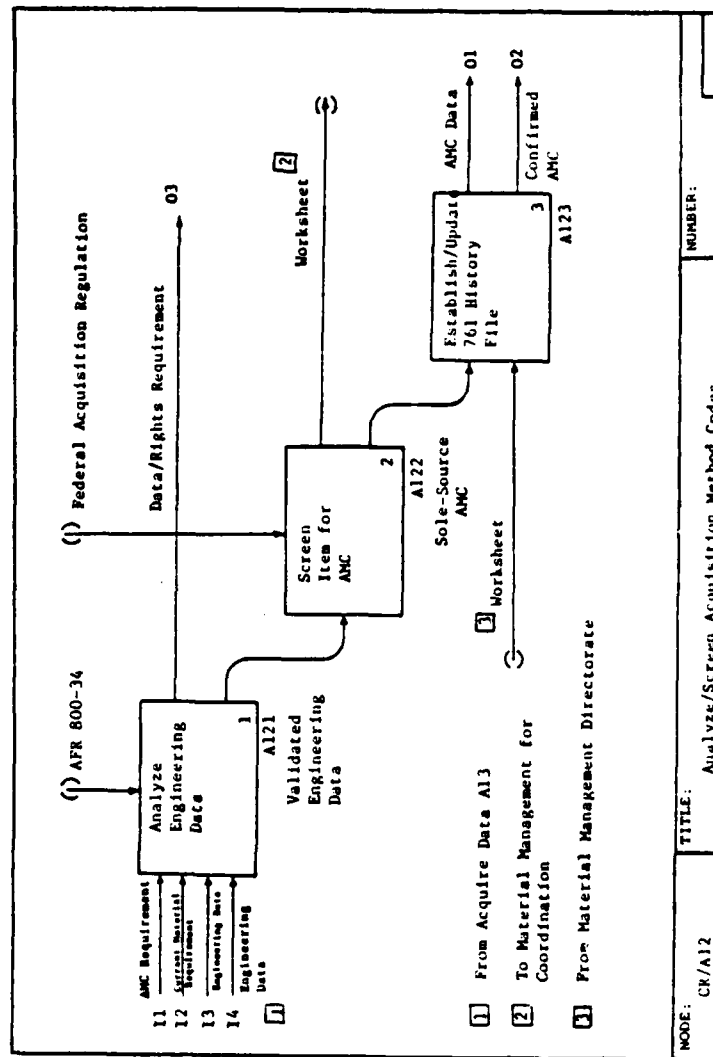


## A122 Screen Item for AMC

The process of screening an item for acquisition method codes begins with receipt of a complete engineering data package. The engineering data is combined with other pertinent acquisition data to form a fully assembled acquisition data package. This package is then reviewed to determine the appropriate acquisition method code. When the proper code has been selected, the AFIC Form 761, Screening Analysis Worksheet, is updated. If the code is for a sole source acquisition, the output will go directly to update the 761 History File; however, if the AMC reflects a competitive acquisition it will be routed back to the Directorate of Material Management for coordination before the update is made.

## Glossary

\$10K limit - At the time of this research a \$10,000 Annual buy threshold had been established as a

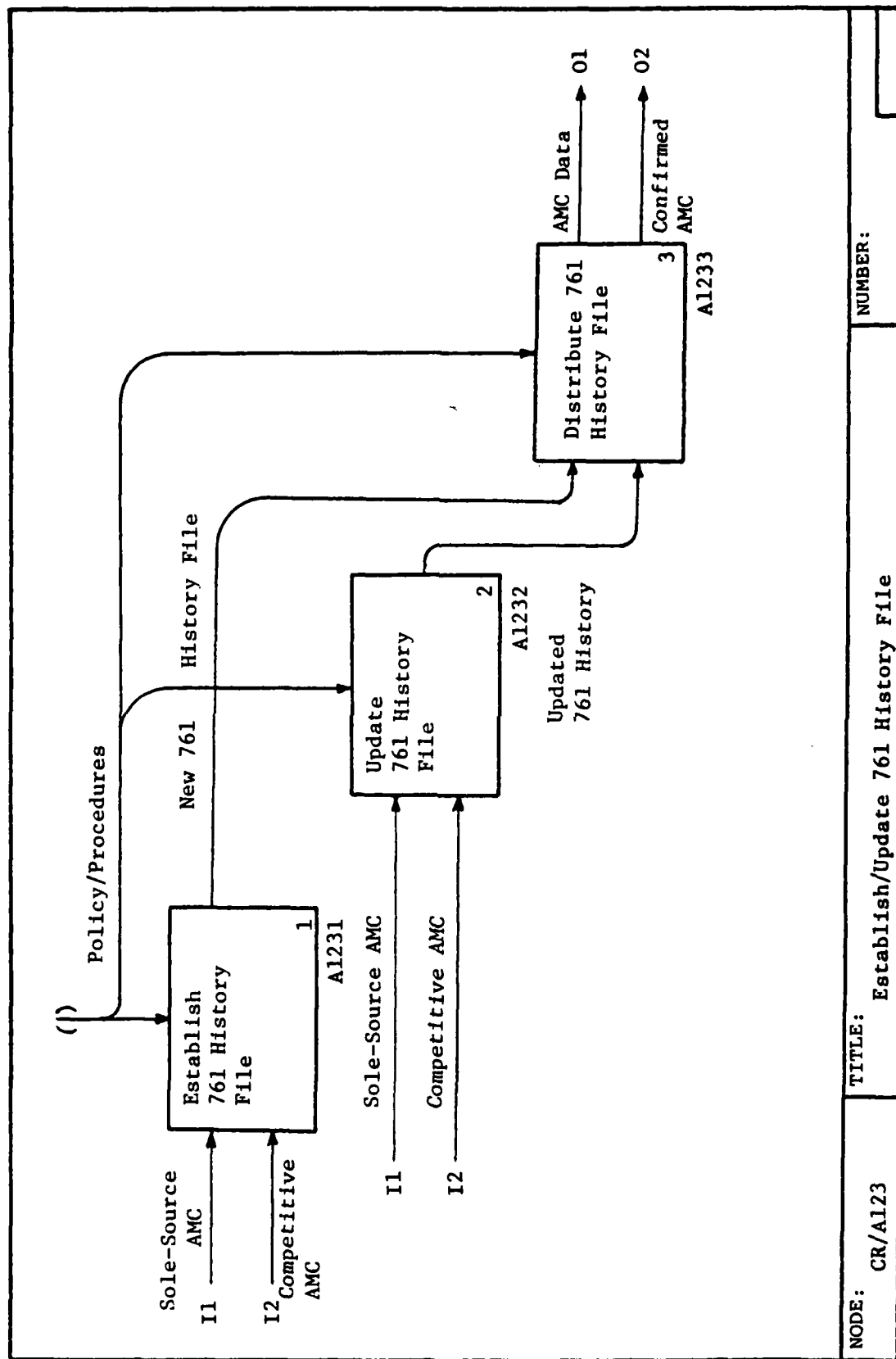


control for the screening process. As the screening process progresses the threshold will be lowered with the goal to screen all items.



Once the Acquisition Method Code is determined the 761 file is updated for an existing item or established for a new item. The 761 history file is then distributed to the appropriate office/organizations and the Acquisition Method Code databases are updated. In all cases, the 761 history update is conducted in accordance with established policy and procedures.

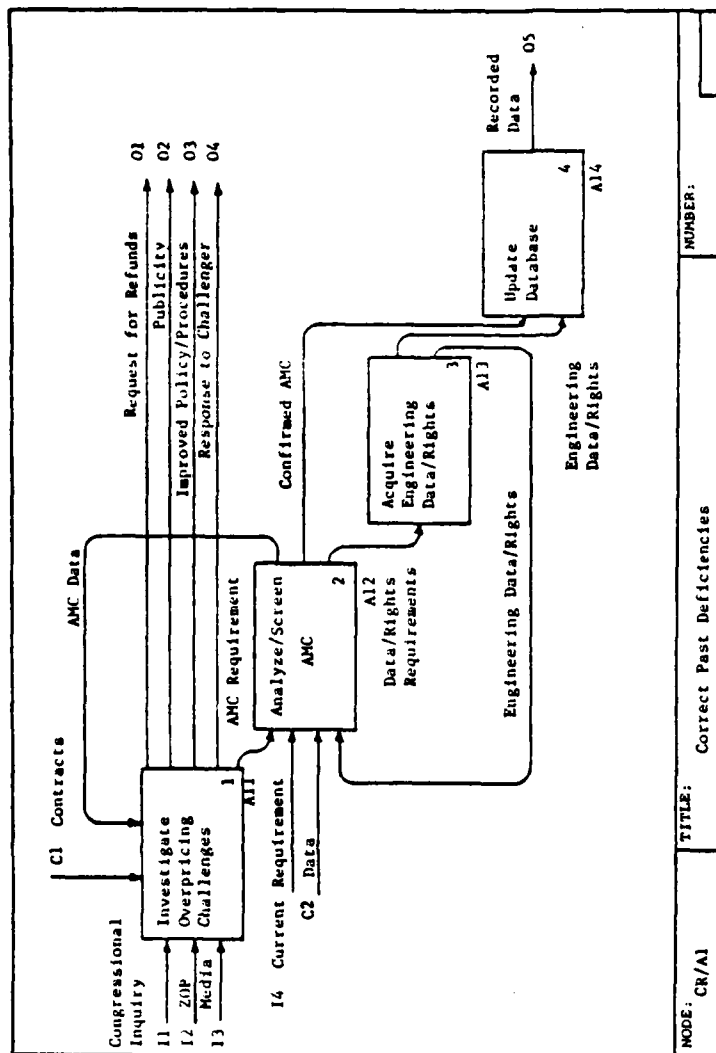






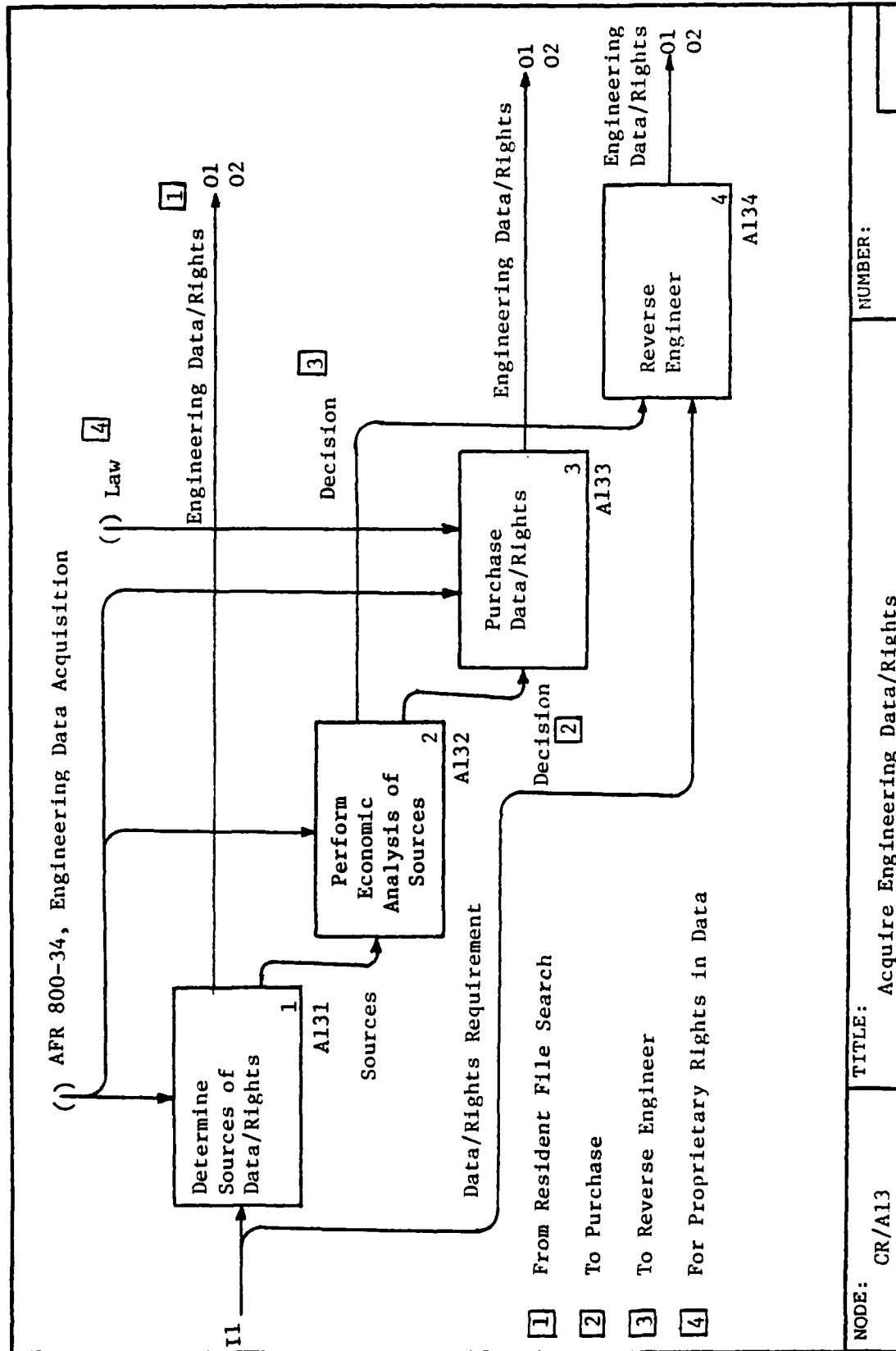
### A13 Acquire Engineering Data/Rights

The search for engineering data, or rights to use the data begins with the known data/rights requirement. Sometimes the data/rights are already possessed and involves only a resident file search. If the data or rights are not possessed by the ALC, an economic analysis of available sources is conducted. The analysis can result in a decision to purchase the data or rights, or a decision to reverse engineer the item. If the decision is made to reverse engineer the item, the proprietary rights question is nullified. Once an item is reversed engineered by the ALC, the ALC possesses all rights to the data they developed. The results of the acquisition of engineering data are valid and current engineering data and the legal rights to use the data.



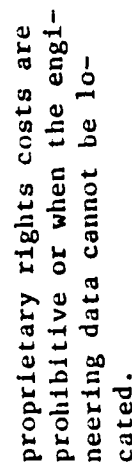
### Glossary

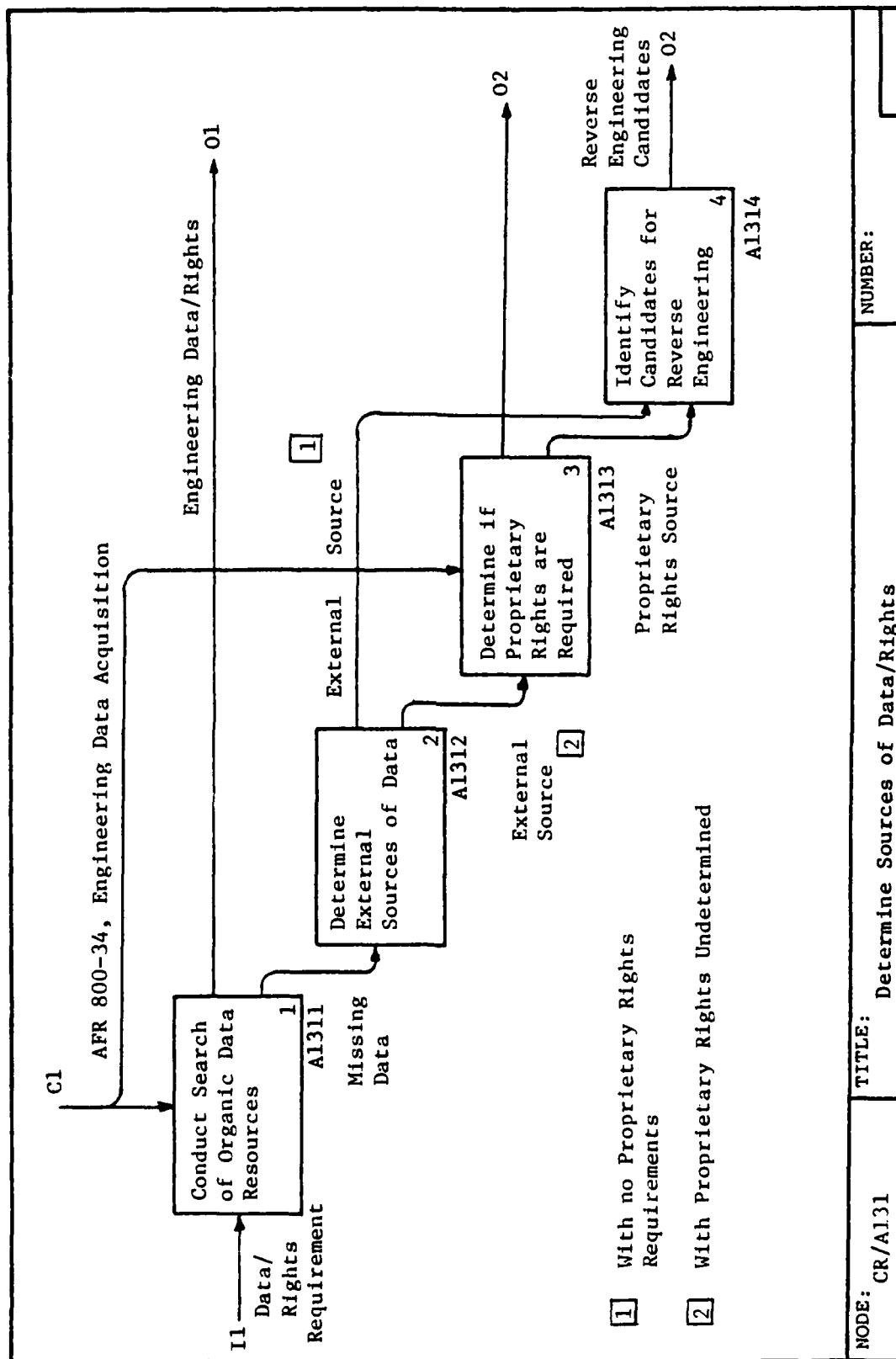
**Reverse Engineering** - The term used to describe all the necessary actions required to supplement or develop an engineering data package for competitive acquisition of an item of supply.



The determination of sources for required engineering data begins with a search of ALC records. Because of the enormous number of items and their associated drawings and specifications the resident file search is extensive. The search may result in a complete data/ rights package and therefore negate the requirement for further search.

Once the sources of data and rights are determined, the item is evaluated to decide whether reverse engineering would be appropriate. Reverse engineering is a complicated and involved task and is usually undertaken when data or

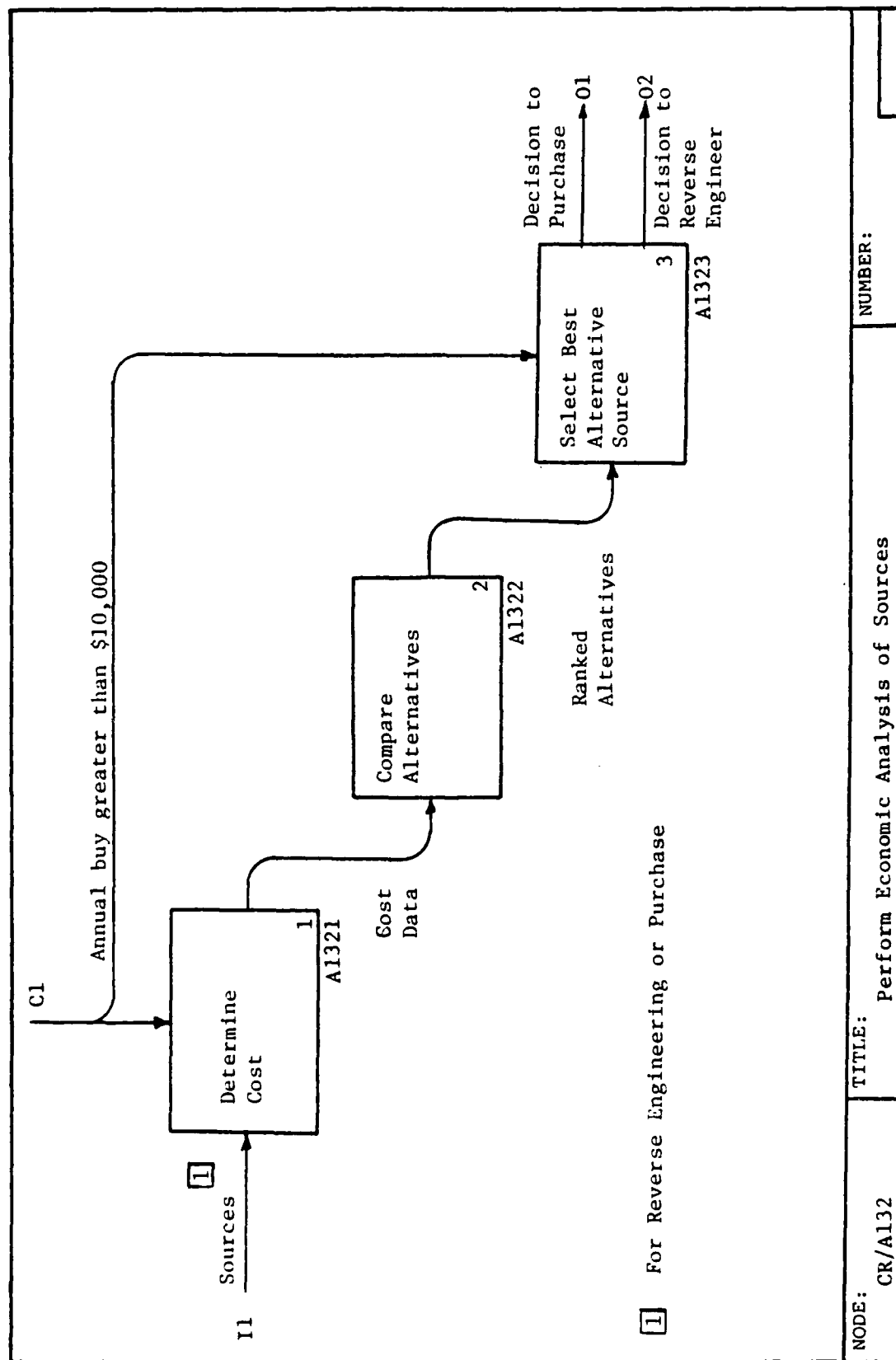




```

graph TD
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A131  
1]
    A131 --> A132[Perform Economic Analysis of Sources  
A132  
2]
    A132 --> A133[Purchase Data/Rights  
A133  
3]
    A133 --> A134[Reverse Engineer  
A134  
4]
    A134 --> 12((12))
    
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    A132 --> 13
    A133 --> 13
    A134 --> 13
    
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    14 --> 15[Engineering Data/Rights  
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02]
    
    A131 --> 16[1]
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    A133 --> 16
    A134 --> 16
    
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02]
    
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    A133 --> 19
    A134 --> 19
    
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02]
    
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    A134 --> 28
    
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02]
    
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02]
    
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    A133 --> 52
    A134 --> 52
    
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02]
    
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    A134 --> 106
    
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02]
    
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02]
    
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02]
    
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    A134 --> 130
    
    130 --> 131[1]
    131 --> 132
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NOOE: CN/A13	TITLE: Acquire Engineering Data/Rights	NUMBER:
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NODE: CR/A132

TITLE: Perform Economic Analysis of Sources

NUMBER:

```

graph TD
    Start(( )) --> D1{1 From Resident File Search}
    D1 --> A131[A131 Determine Sources of Data/Rights]
    D1 --> A134[A134 Reverse Engineer]
    A131 --> A132[A132 Perform Economic Analysis of Sources]
    A132 --> A133[A133 Purchase Data/Rights]
    A133 --> A134
    A134 --> Out1[01 Engineering Data/Rights]
    A134 --> Out2[02 Engineering Data/Rights]
    A134 --> D4{4 For Proprietary Rights in Data}
    D4 --> A134
    D4 --> Out1
    D4 --> Out2
  
```

11

(1) AFR 800-34, Engineering Data Acquisition

(1) Lav

Engineering Data/Rights

01

02

Decision

3

Engineering Data/Rights

01

02

Reverse Engineer

A134

4

A133

Purchase Data/Rights

3

Decision

2

A132

Perform Economic Analysis of Sources

2

Sources

A131

Determine Sources of Data/Rights

1

1 From Resident File Search

2 To Purchase

3 To Reverse Engineer

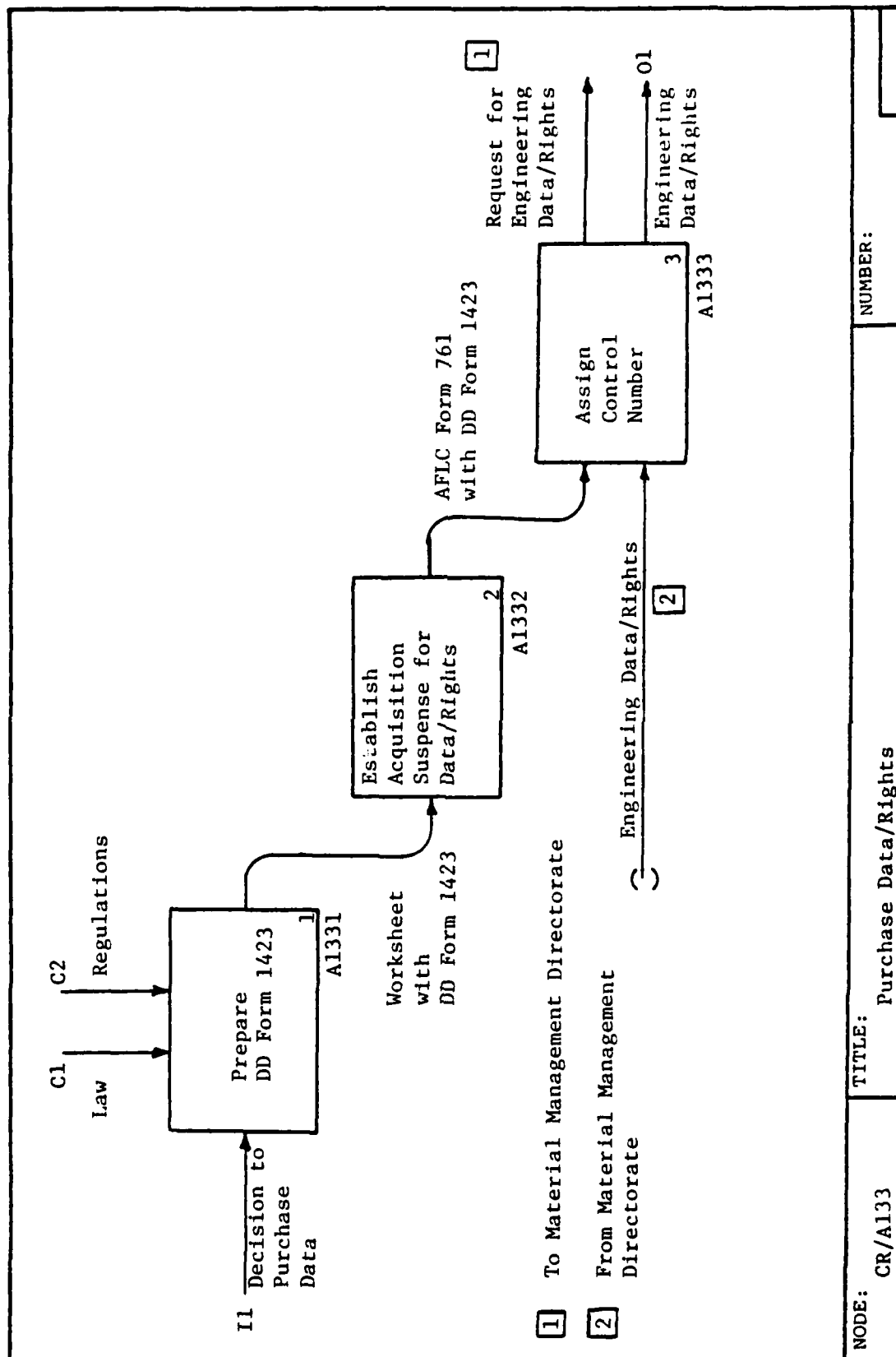
4 For Proprietary Rights in Data

MODE: CR/A13

TITLE: Acquire Engineering Data/Rights

NUMBER:

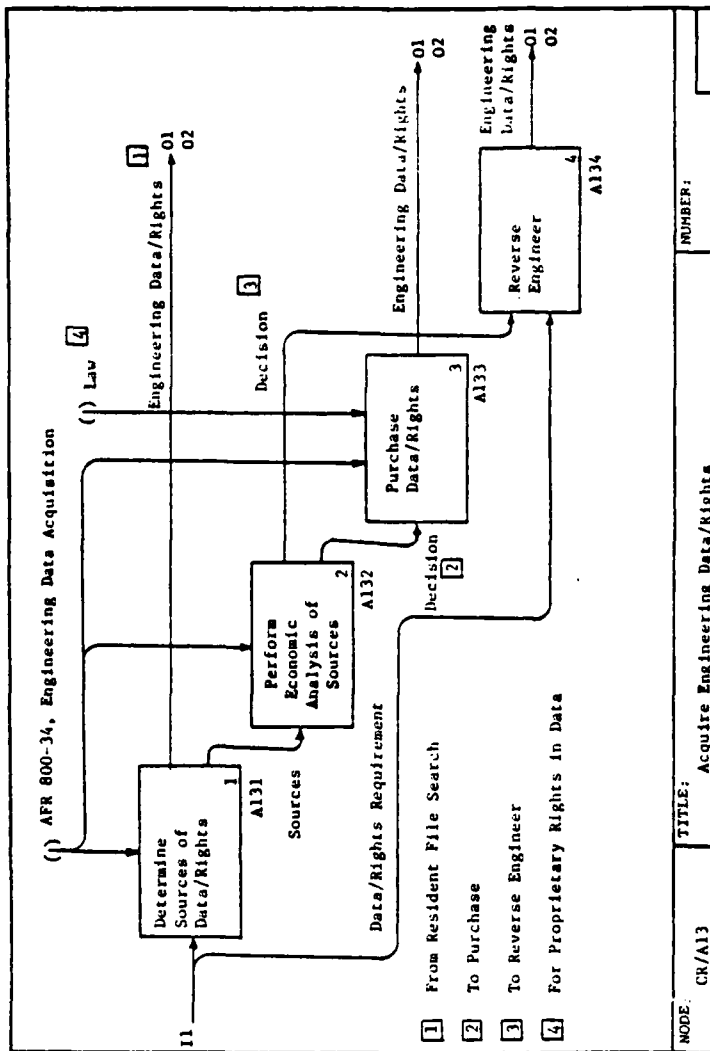
The forms are then forwarded to the Directorate of Material Management for purchase, and a copy of the DD Form 1423 is retained in the CR Directorate for historical purposes. When the engineering data/rights are received from the Directorate of Material Management, control numbers are cleared and the data is available for use.

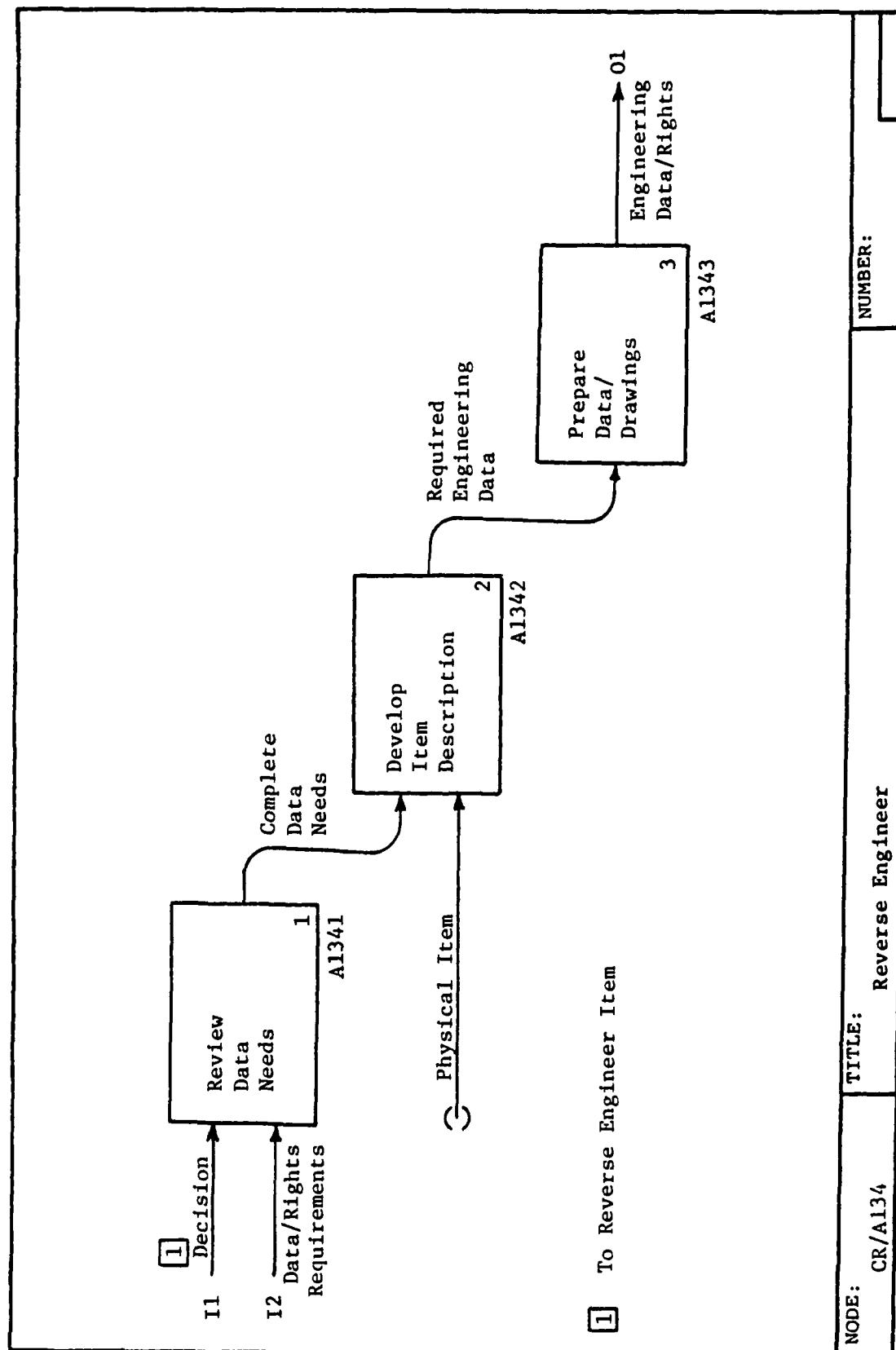




# A134 Reverse Engineer

When a decision to reverse engineer an item is made, the engineers in the Directorate of Competition Advocacy determine the specific aspects of data needed. To make an item competitive a comprehensive item description must be provided to potential vendors. Engineers will examine the item, disassemble it as necessary, and provide a description of each component. Complete drawings are made, and the engineering data is prepared to meet competitive acquisition requirements.





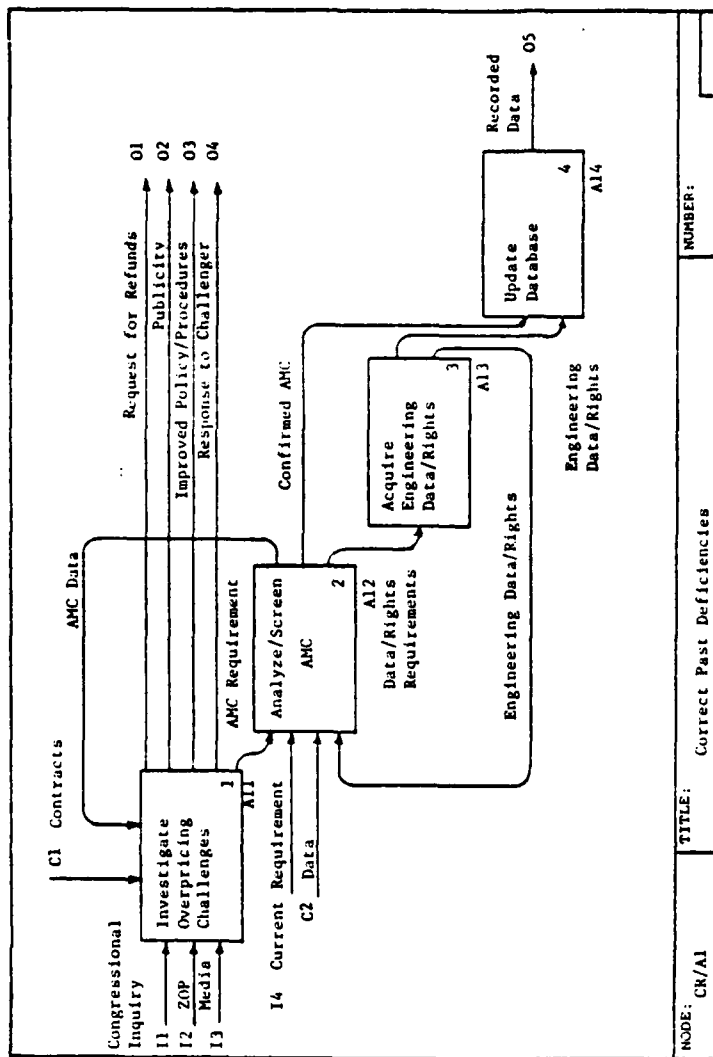
NODE: CR/A134

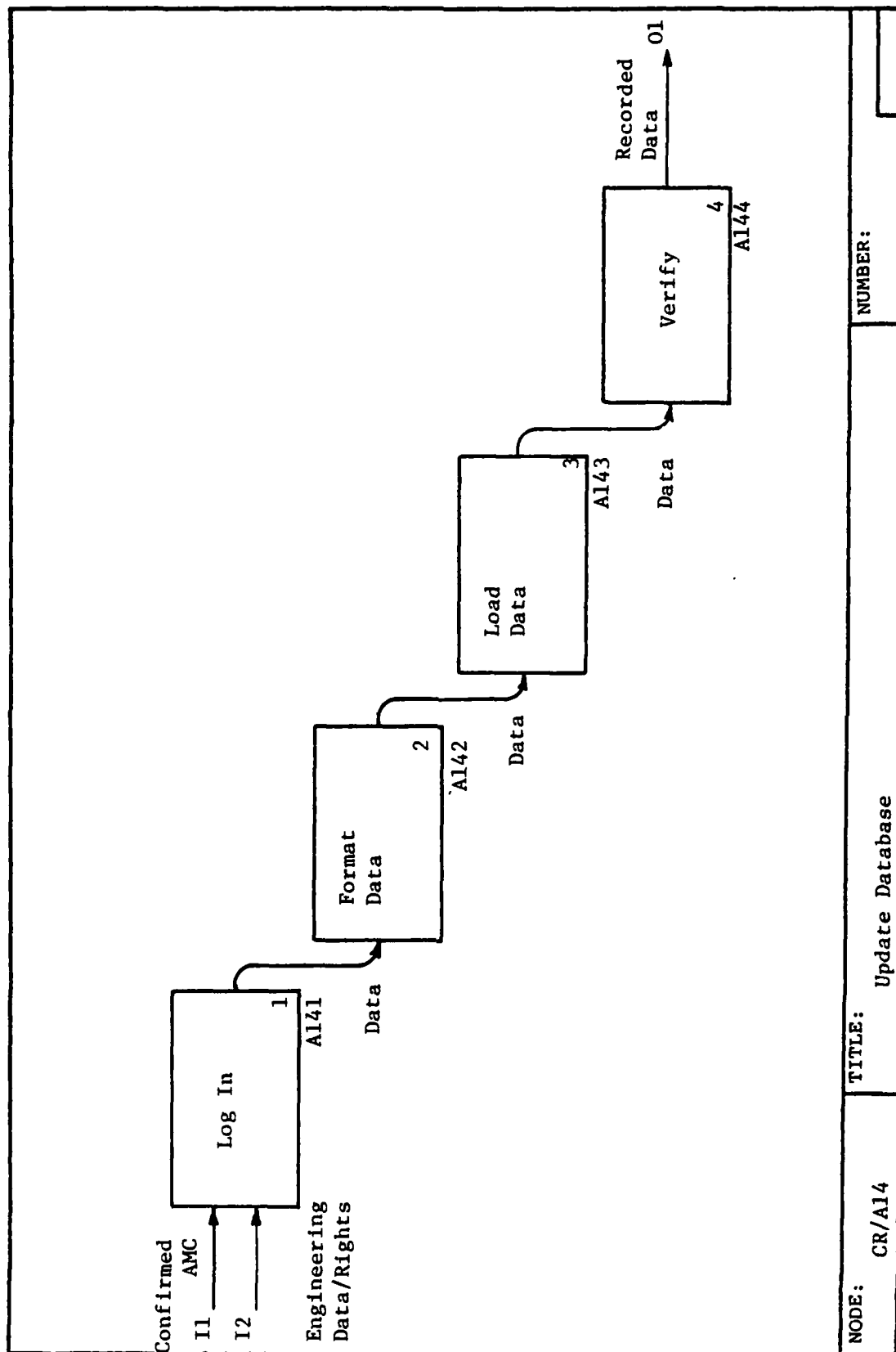
TITLE: Reverse Engineer

NUMBER:

#### A14 Update Database

The process of updating the database is a routine function which must be accomplished to ensure that future actions requiring acquisition data can be accurately performed. Verification is an important aspect of this process, and ensures the accuracy of the database.



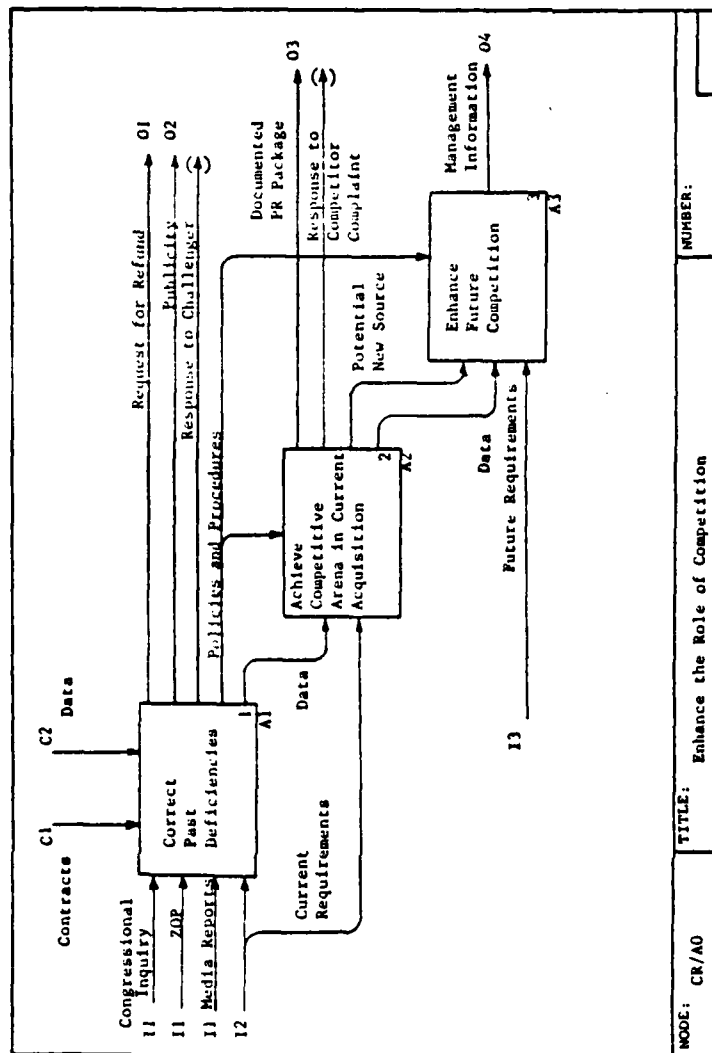


## A2 Achieve Competitive Arena in Current Acquisition

This function provides the means to ensure that competition is optimized in the process of acquiring the material, supplies, equipment, and services needed within the current budget execution period. It includes the oversight role in reviewing current purchase requests, analysis of prices for sole source acquisitions, the acquisition and management of purchasing data, and customer support. As noted on the diagram, feedback loops provide essential information and source data to complete tasks and update the database when required.

### Glossary

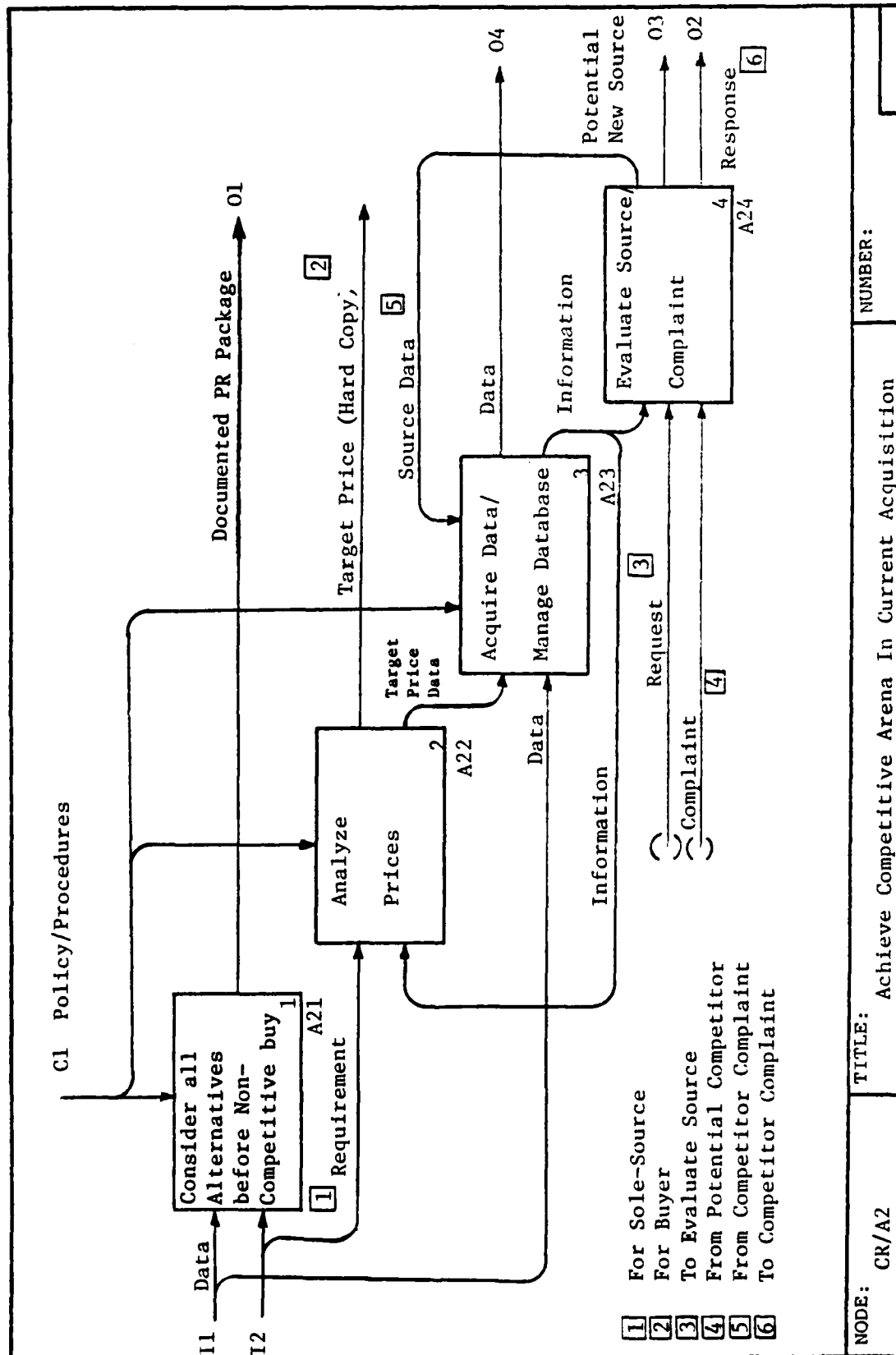
**Target Price** - The target price consists of a completed data package and a computer generated sheet defining the breakout of the target price; i.e. manhours, material cost, overhead, and administrative costs.



Source Data - Data which defines the name of a manufacturer, the product produced by that manufacturer, the qualifications of the manufacturer, and information such as address and phone number.

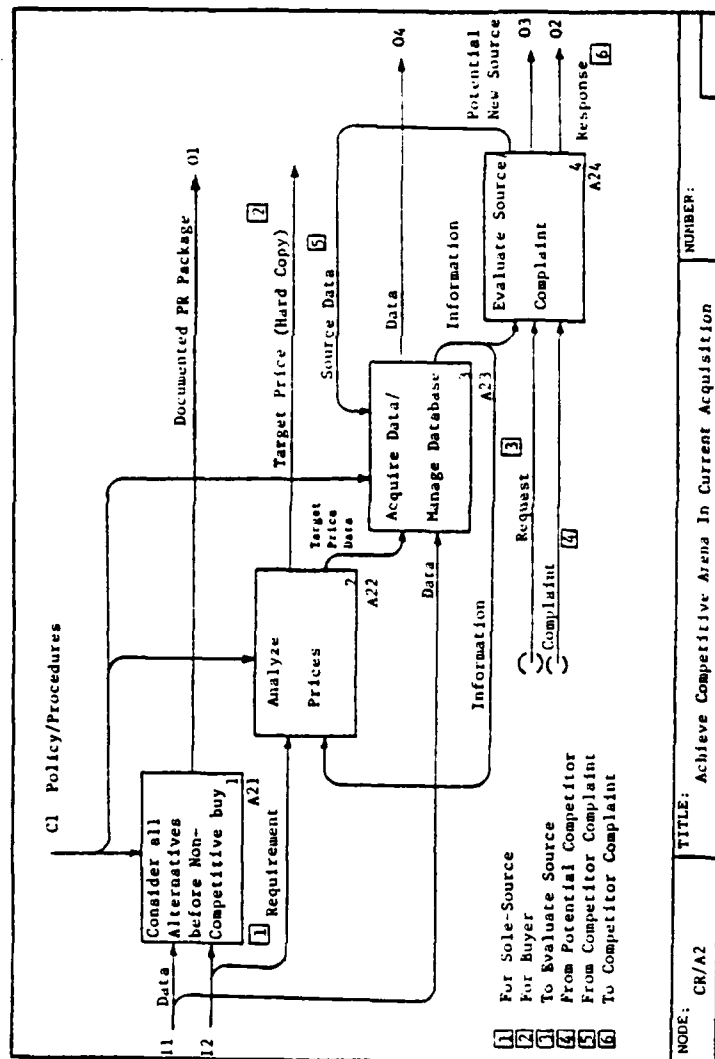
Information - Information referred to in the diagram is that data acquired to

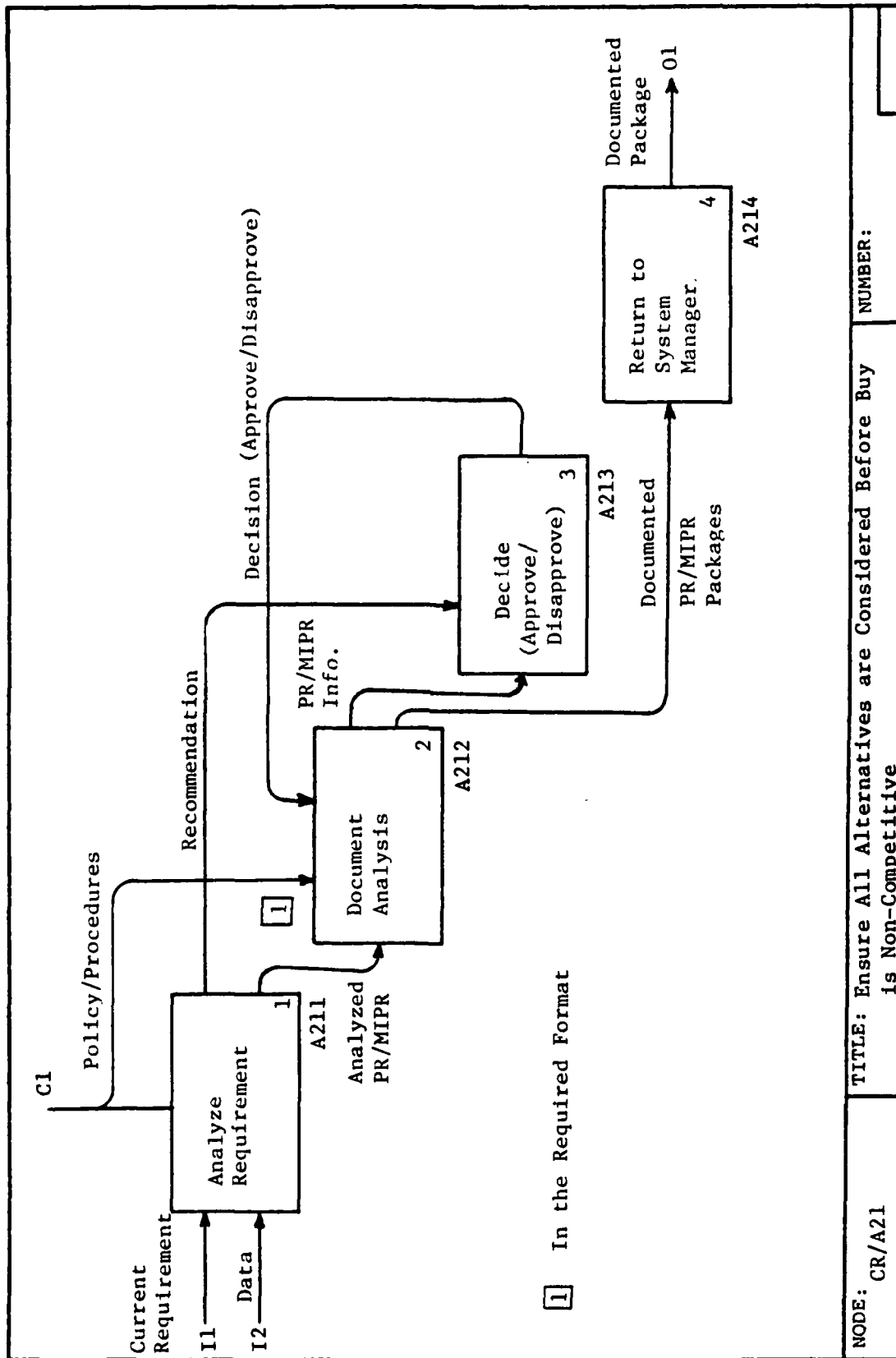
enable the price analyst to establish a valid level II target price.



## A21 Ensure All Alternatives are Considered Before Buy is Non-Competitive

To ensure all alternatives are considered before purchasing an item in a non-competitive market, the engineering data package is compared to the current operational requirement. Once analyzed, the Competition Advocate function must then decide if a non-competitive purchase is the appropriate method of buying. This is one area where the Competition Advocacy Directorate may exercise control in the purchasing process. The decision to approve/disapprove the acquisition method is documented and the acquisition package is returned to the system/item manager. A disapproval may result in a revised acquisition method or elevation to a higher decision authority. Cooperation between the Competition Advocacy Directorate and the Directorate of Material Management precludes unnecessary delays and decision impasses.





NODE: CR/A21	TITLE: Ensure All Alternatives are Considered Before Buy is Non-Competitive	NUMBER:
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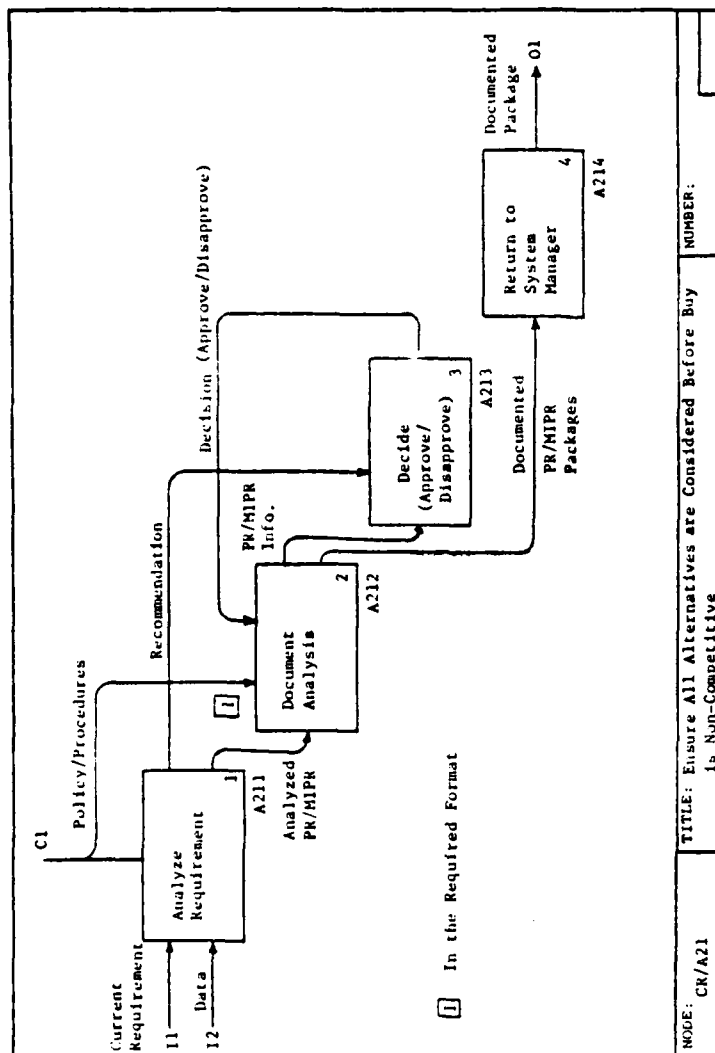
## A211 Analyze Requirement

The current requirement and item history data are received and screened. The PR/MIPR's are separated into competitive and non-competitive Acquisition Method Code items. The recommendations are for approval/disapproval of the PR/MIPR as submitted. The competitive AMC items are screened to determine if a first article requirement exists.

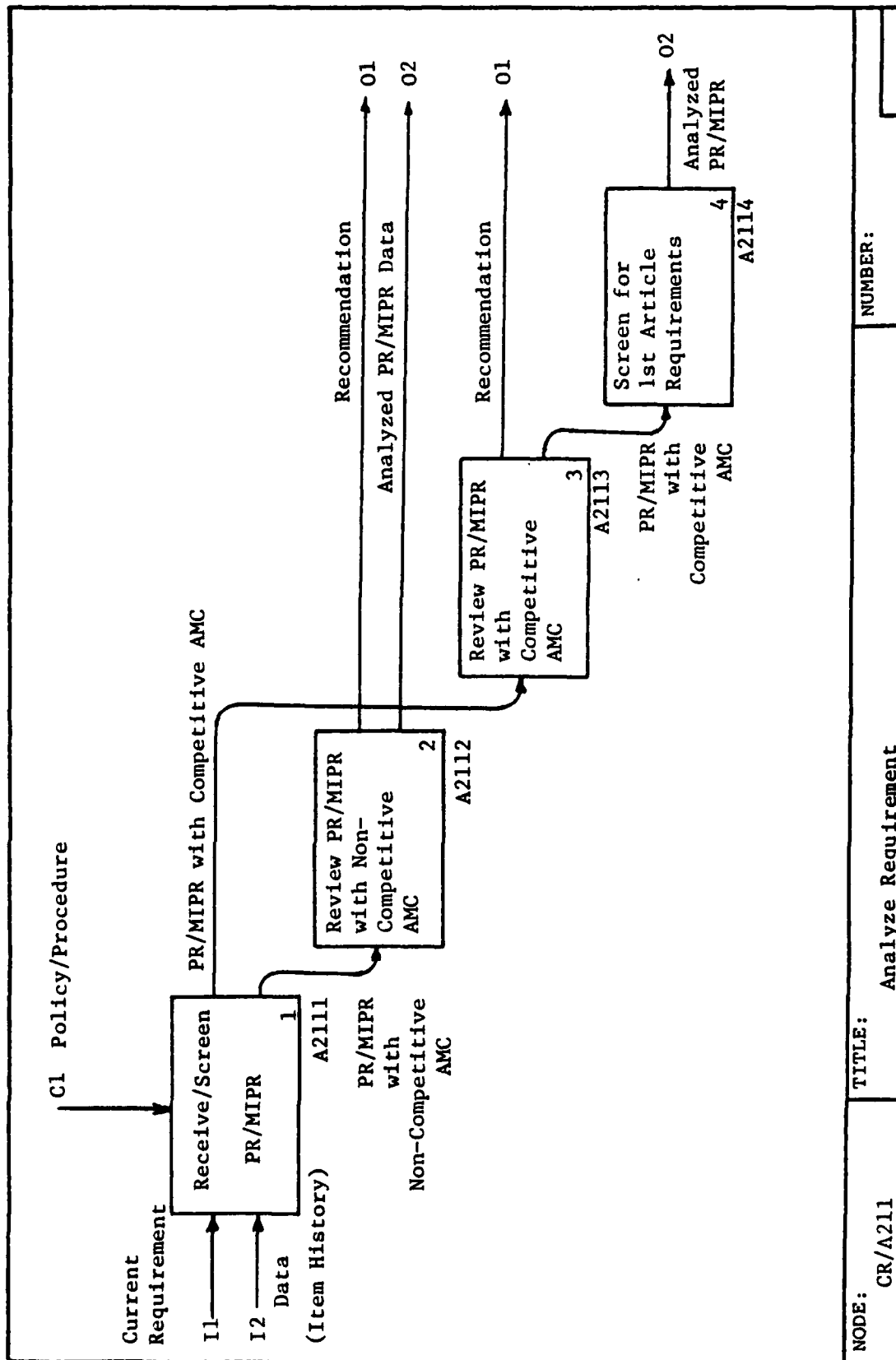
## Glossary

**First Article Requirement -**  
**First Article Inspection Requirement -** This inspection requirement is documented on AFLC Form 1946. It is used to identify requirements and conditions for approval of a contractor's first produced items prior to being given authorization to proceed with a production quantity contract.

**PR/MIPR -** Purchase Request/  
 Military Interdepartmental  
 Purchase Request - These forms

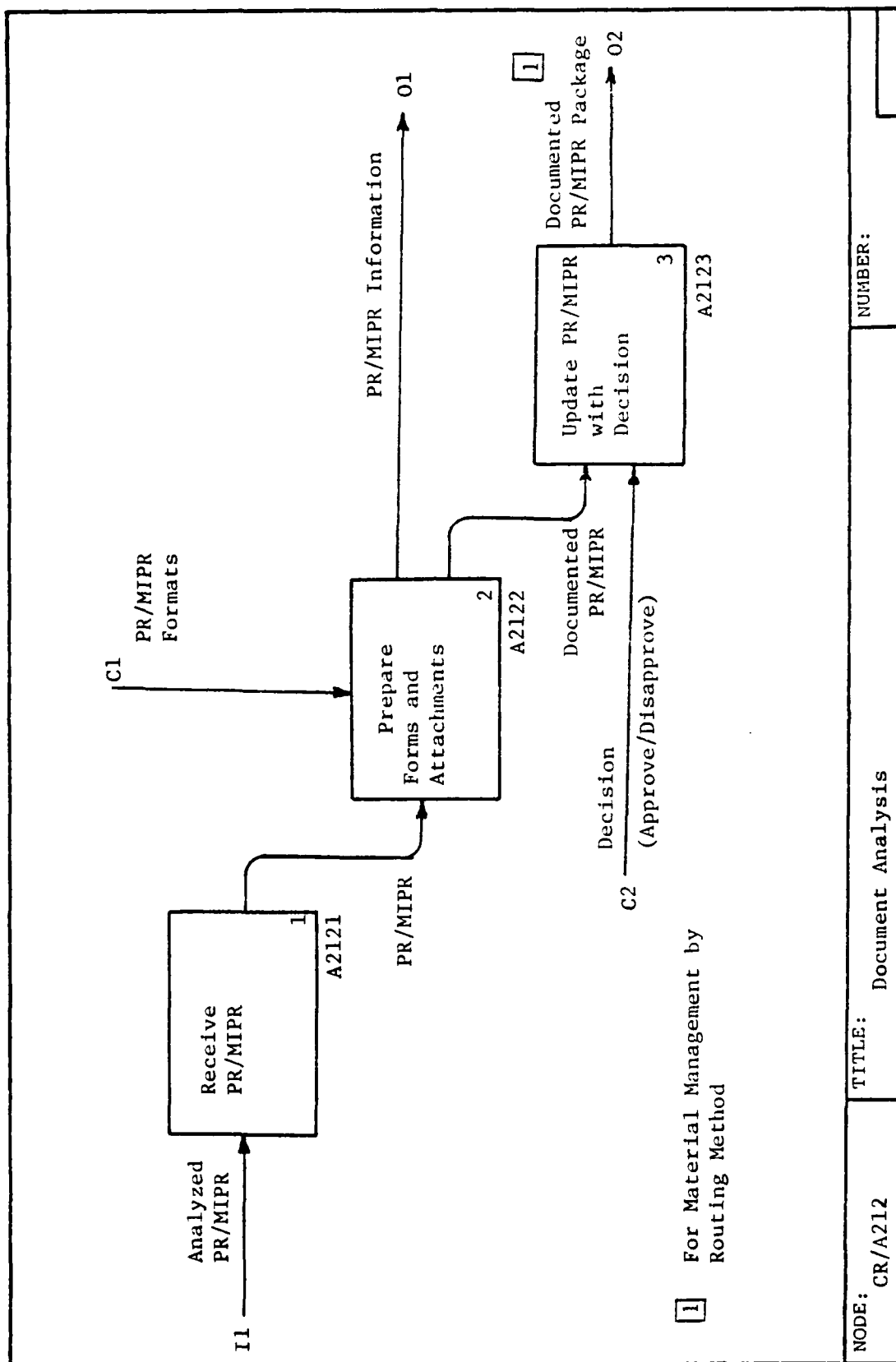


are used to acquire supplies, services, and data. It advises the contracting officer what is to be placed on the contract.



During the review of purchase requests, Engineering Data Management Division personnel document the results of their analysis. As the analysis is accomplished, the necessary forms and information are attached to the package. When a decision to approve or disapprove the acquisition method is reached, the decision is documented before the package passes to the next step in the acquisition process.





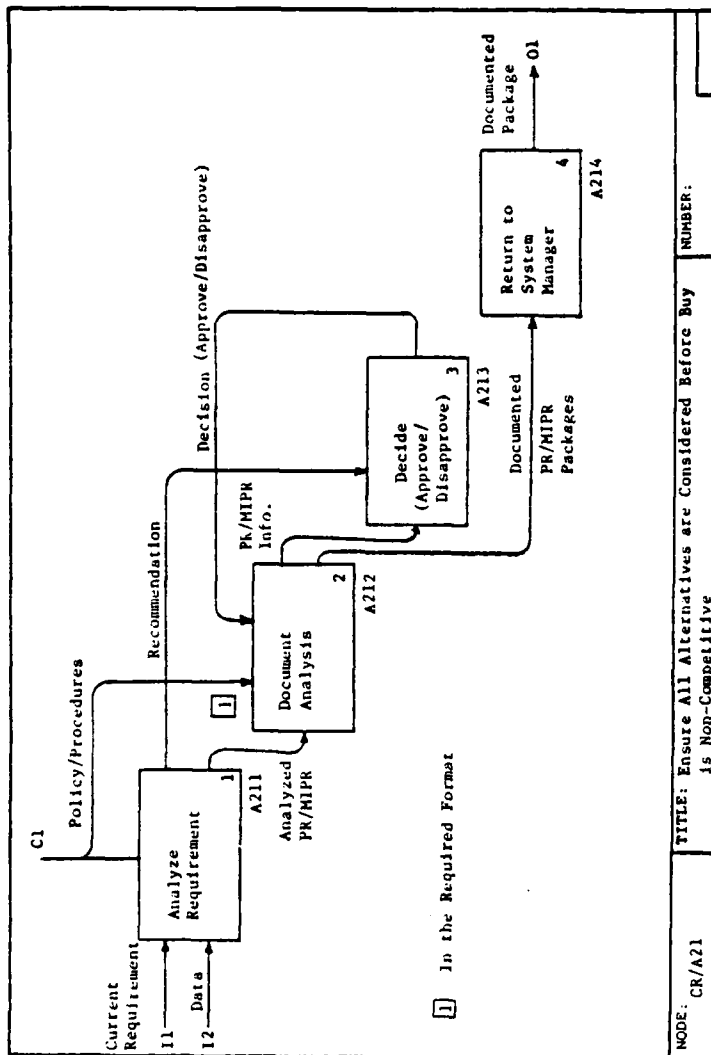
## A213 Decide to Approve/Disapprove AMC

The decision authority within CR receives the analyzed PR/MIPR information. The decision is then made to approve or disapprove the acquisition method code by comparing the PR/MIPR information and the recommendation from the initial analysis (A211). The approval or disapproval is feedback through the documentation process (A212). A disapproval of a recommended AMC is further evaluated to resolve any conflicts. An approval of the AMC as recommended, is documented for return to the system manager.

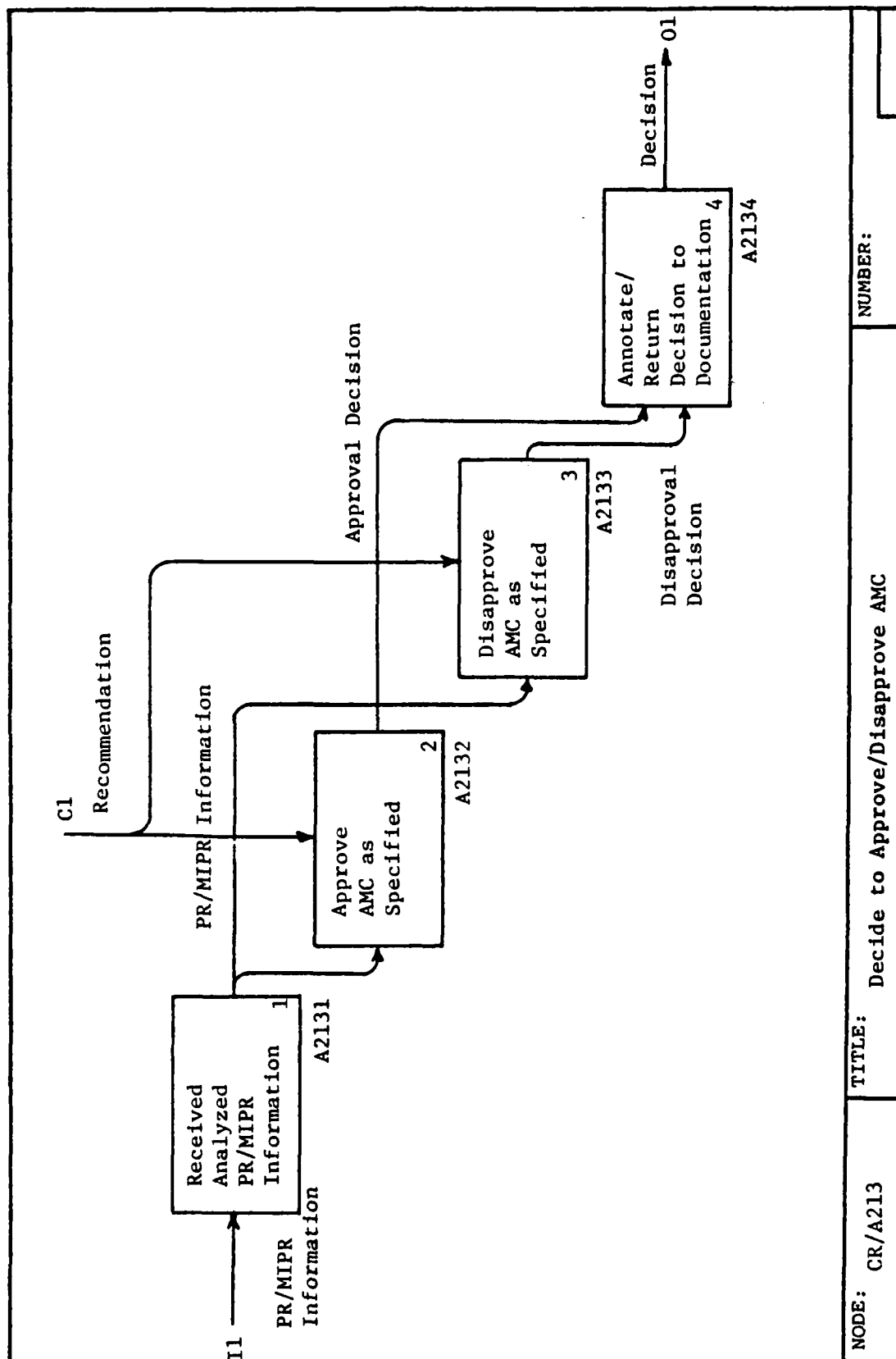
## Glossary

**Approval Decision** - As an example, the CR activity may concur with a non-competitive purchase because of time and/or performance constraints.

**Disapproval Decision** - A disapproval of an Acquisition Method Code may result when



the CR activity possesses data and the purchasing activity does not. The overwhelming majority of conflicts are resolved at the lowest level. Should the need arise, conflicts can be elevated to the Directorate level for resolution.



NODE: CR/A213

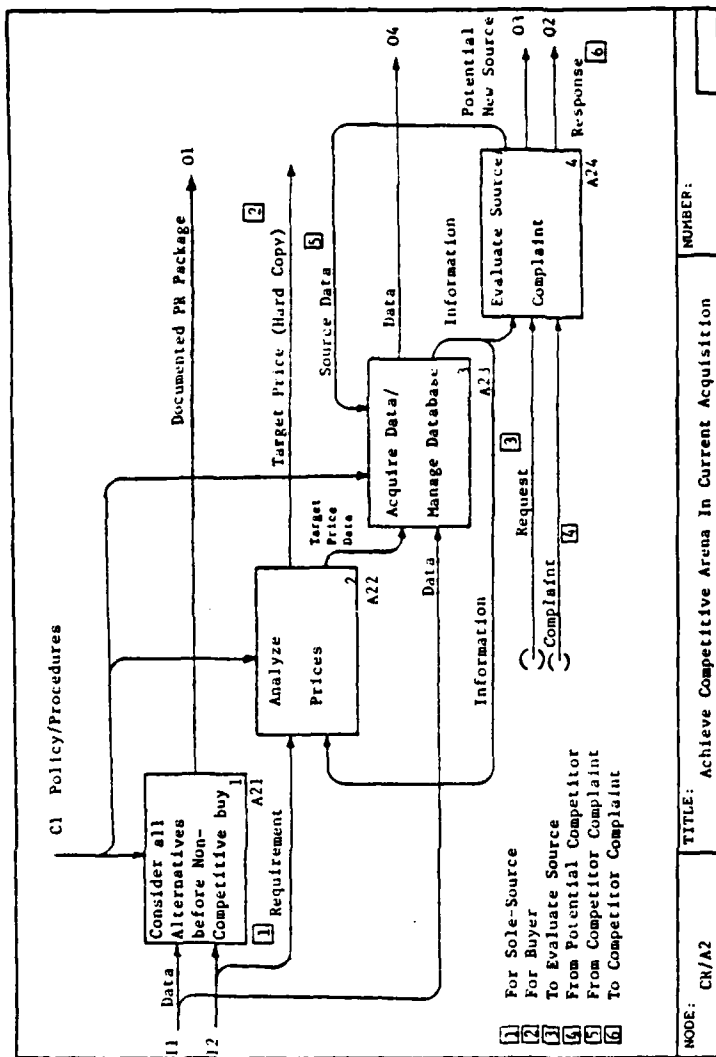
TITLE: Decide to Approve/Disapprove AMC

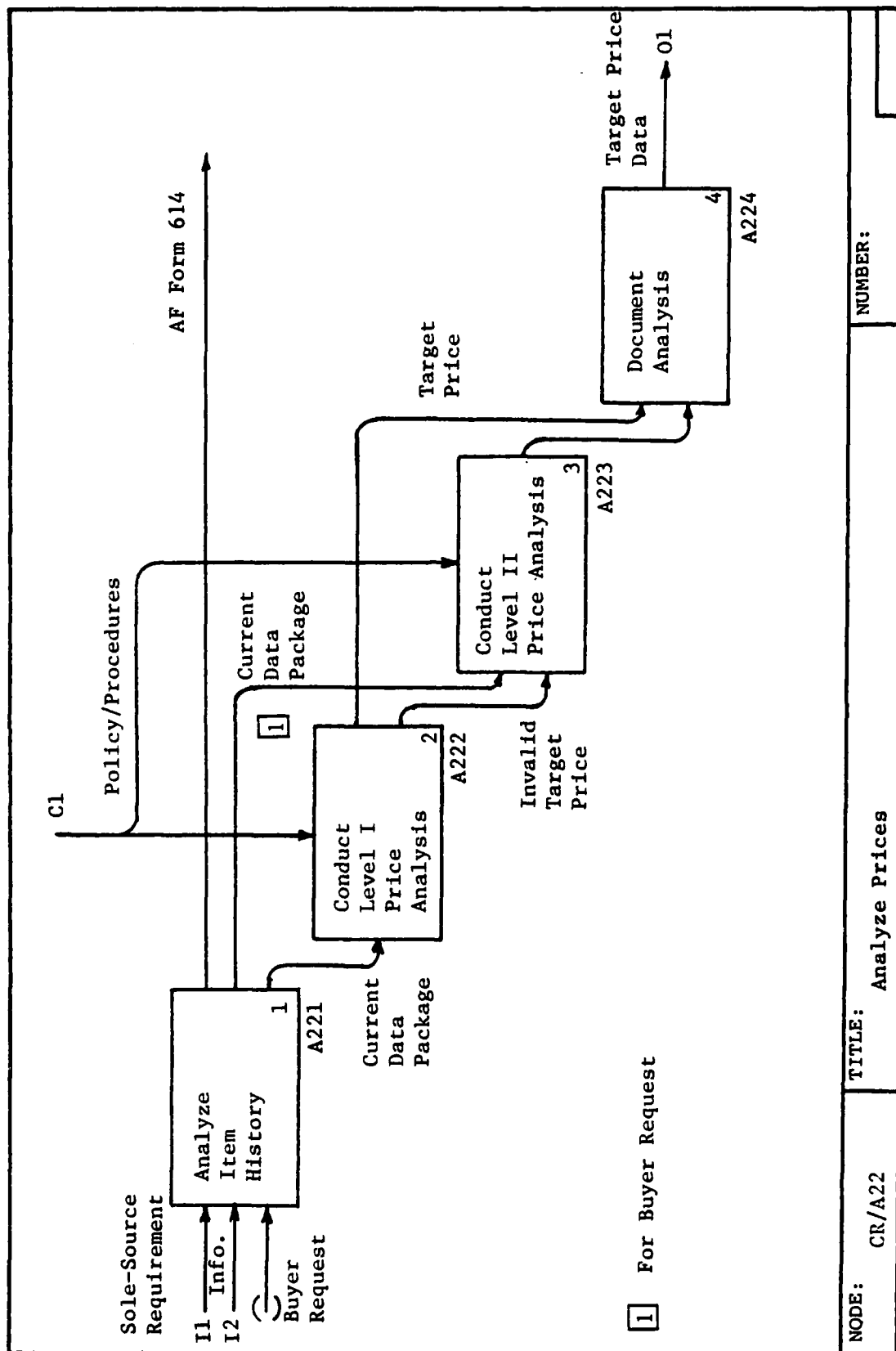
NUMBER:

## A22 Analyze Prices

The analysis of prices is initiated by a current purchase request for an operational need. The Price Analysis Division will evaluate the item's acquisition history to determine if the purchaser's requirement for a sole source acquisition is necessary. If valid, a level I and/or level II price analysis will be performed and documented.

Price analysis can also be conducted at buyer request. This occurs when a buyer requests a price analysis for an item that appears to be overpriced, or a target price is needed for contract negotiation. In this case, the item's history is analyzed and if required, a level II price analysis is performed.







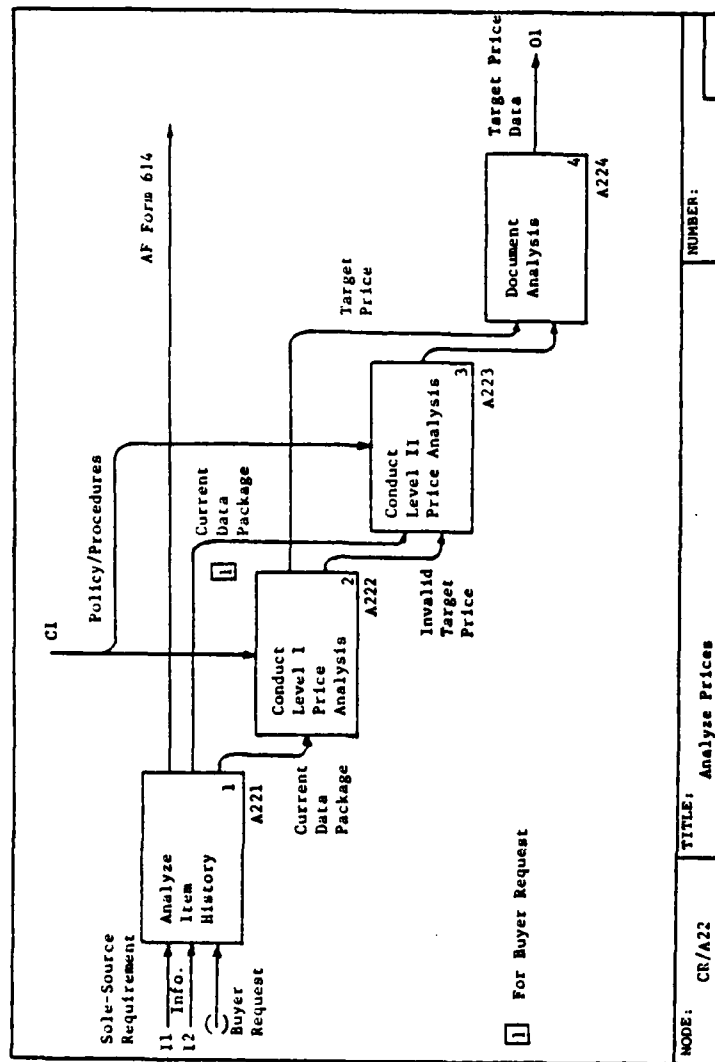
## A221 Analyze Item History

The first step in price analysis (diagram A22), is to analyze the item's acquisition history. To accomplish this function, the Price Appraisal Division prepares a current acquisition data package. The current acquisition data package includes all historical price appraisal data. The package is then updated and a computer file is established using the J041 or DIDS databases. The package is then assembled and forwarded for a level I or level II price analysis as appropriate.

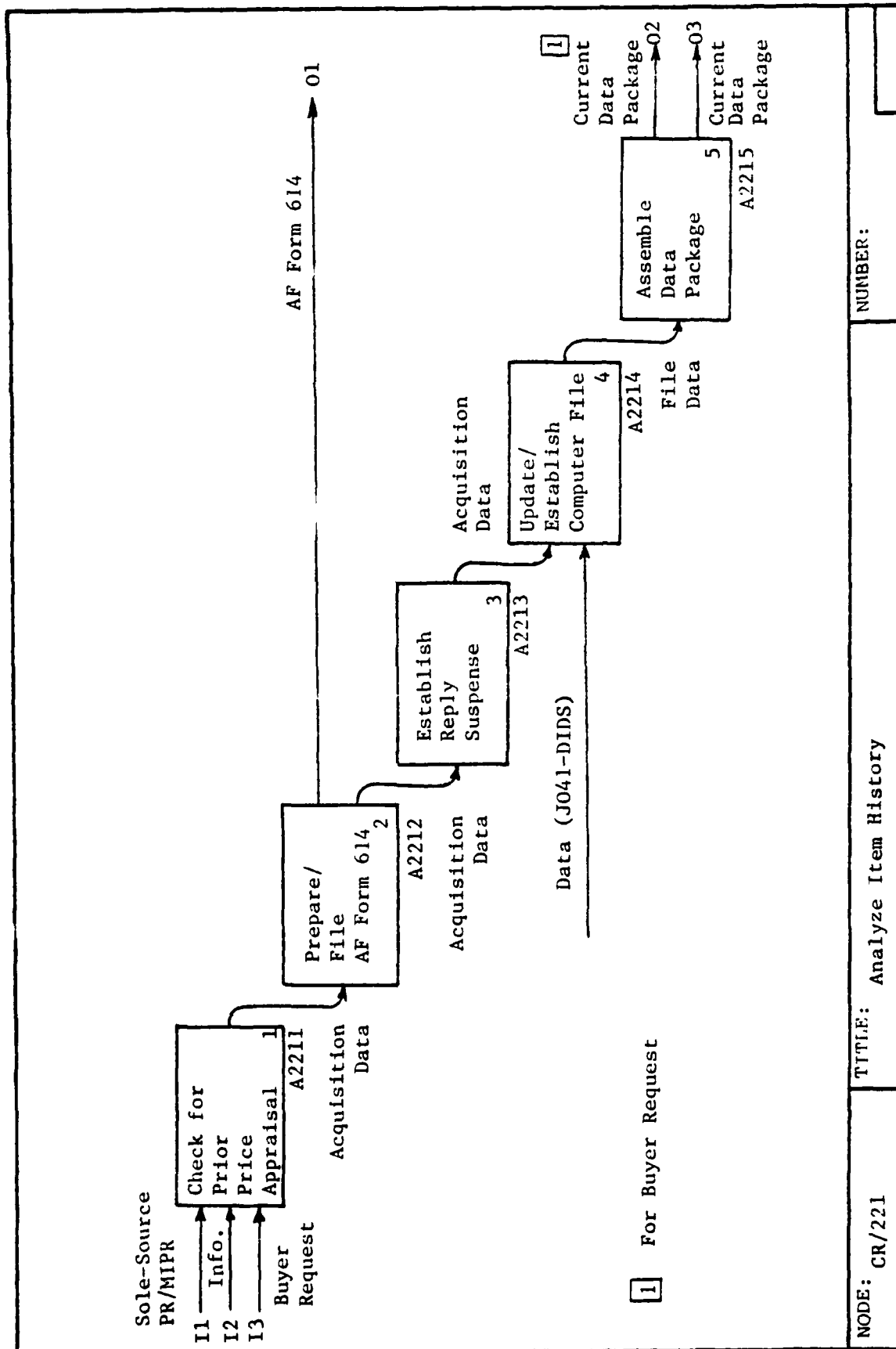
## Glossary

DIDS - Defense Integrated Data System - A logistics management information system designed to receive, store, process, and disseminate item identification and other related logistics information.

J041 - Procurement History Record - The J041 is an automated acquisition history system resident on cyber



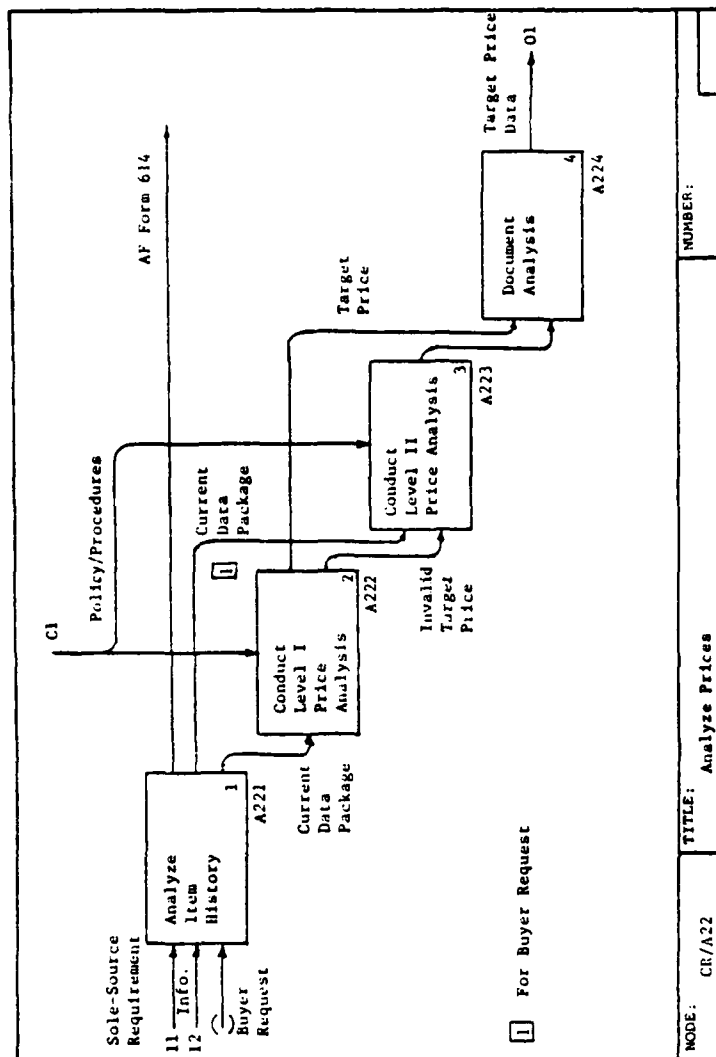
computers within AFLC.

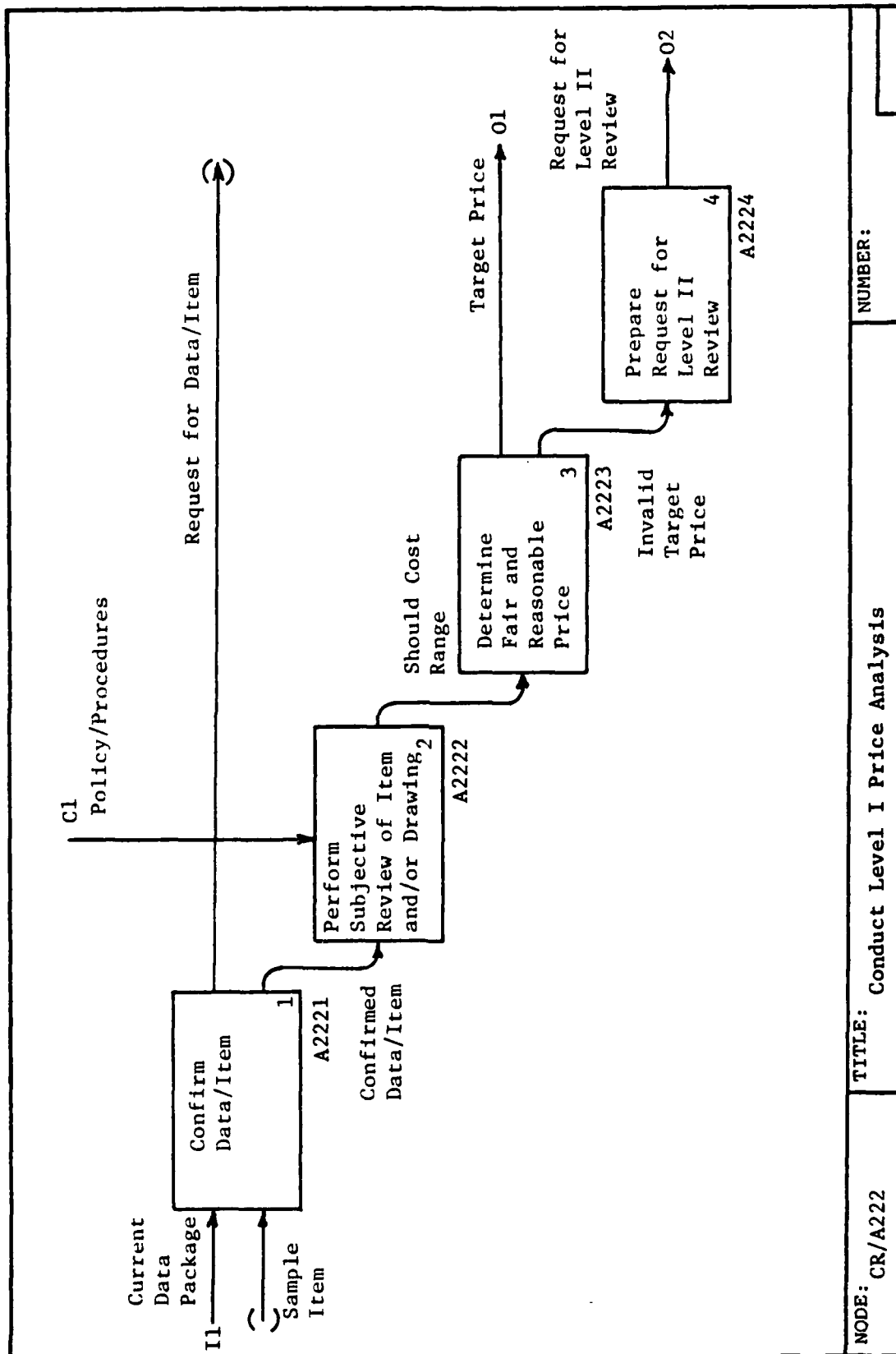


**A222 Conduct Level I Price Analysis**

A level I price analysis is performed by subjectively reviewing the data package and the item to determine a target price. If a target price cannot be determined subjectively, the item and data package are referred for a level II price analysis, (See diagram A112).

A level I price analysis is performed by subjectively reviewing the data package and the item to determine a target price. If a target price cannot be determined subjectively, the item and data package are referred for a level II price analysis, (See diagram A112).





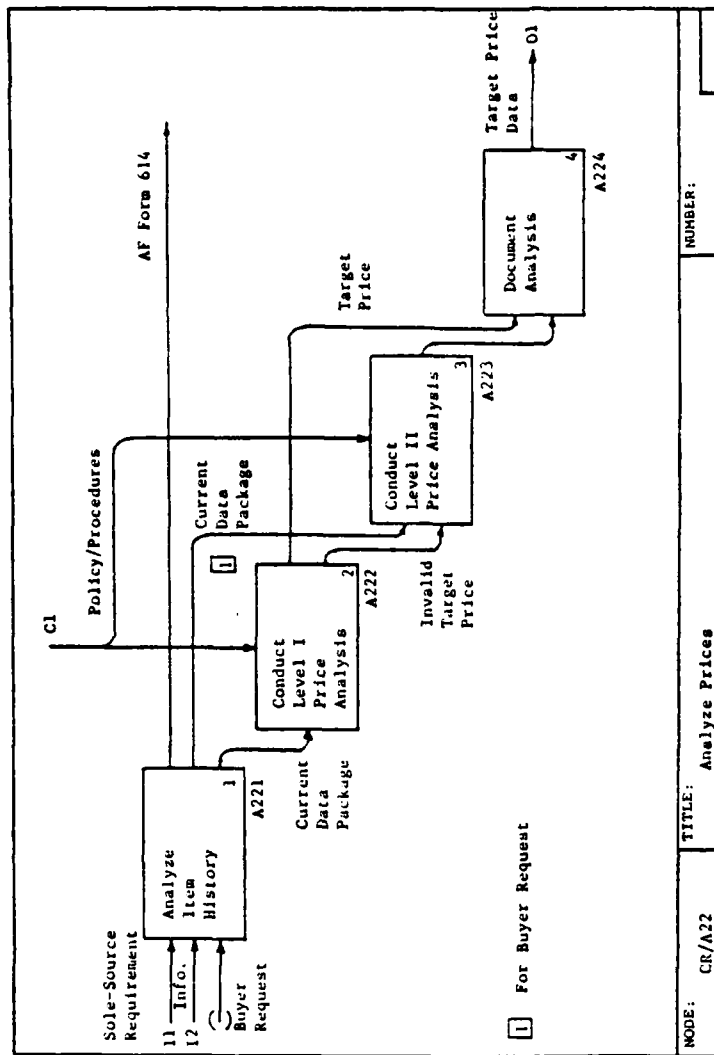
NODE: CR/A222

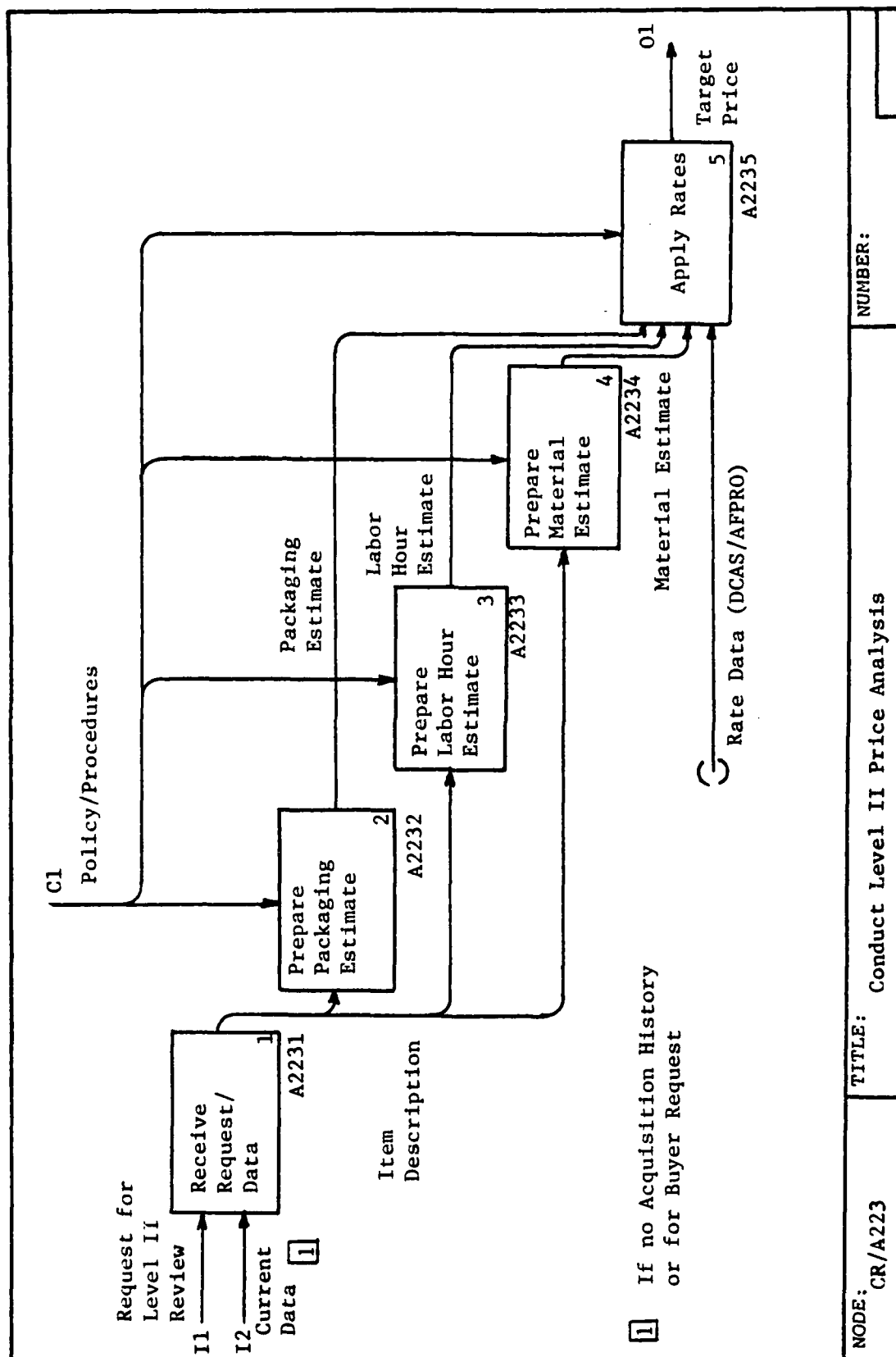
TITLE: Conduct Level I Price Analysis

NUMBER:

## A223 Conduct Level II Price Analysis

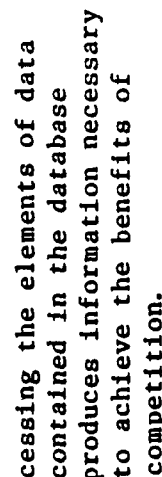
Should the item require a level II price analysis, a price analysis team is formed to effectively evaluate all aspects of the item's cost. The team includes pricing experts for packaging, labor, and material. Appropriate rates are then applied to determine a target price, (See diagram All3).

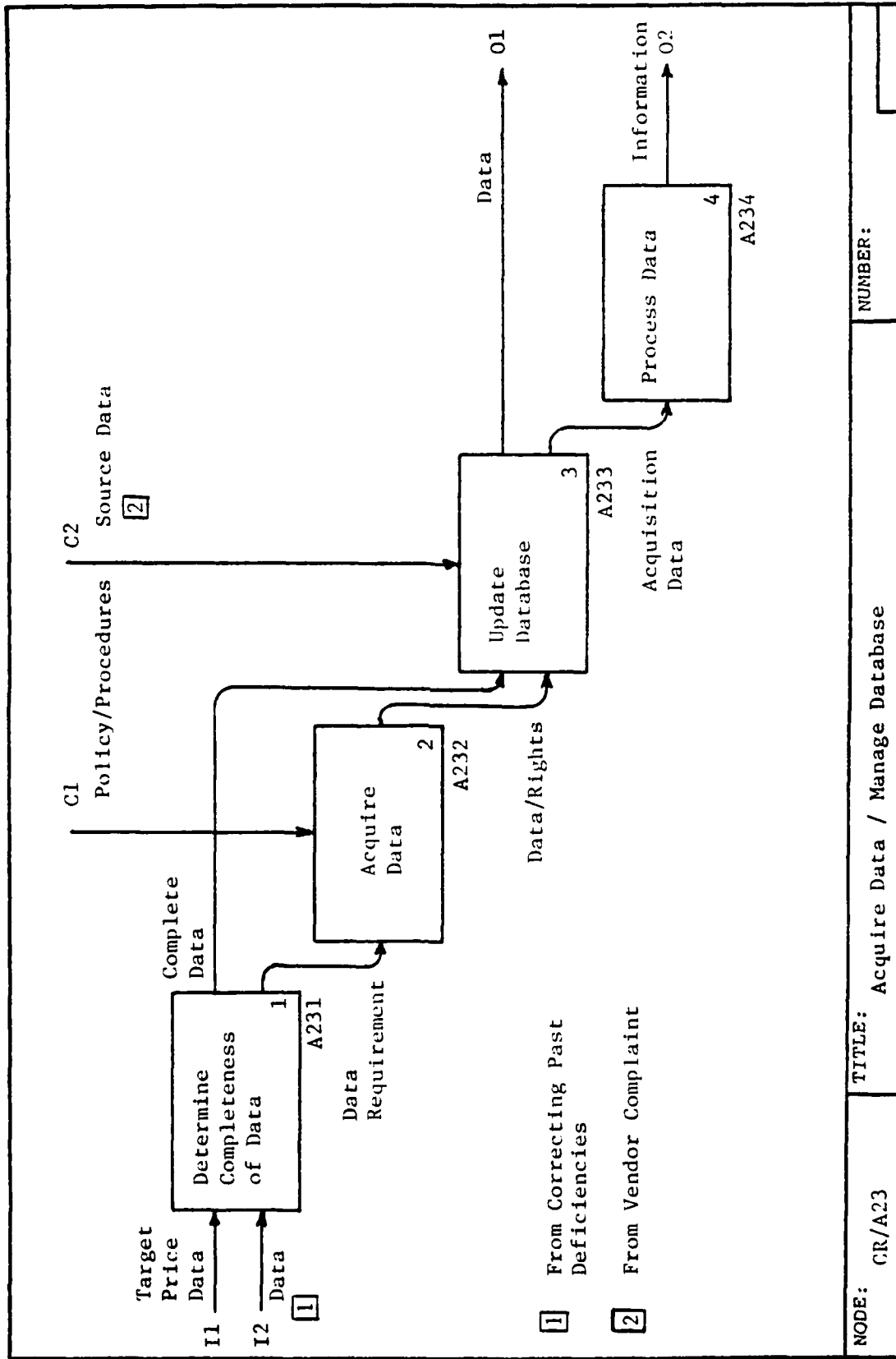




The acquire data / manage database processes are two of the important activities of the Directorate of Competition Advocacy. The acquisition of data involves managements efforts to gain required data. These needs arise from missing historical data for current and future acquisitions. Once the required data is obtained, the Directorate's task is then to manage the database effectively.

**Establishing a complete and well maintained database provides essential data to plan for future buys. Pro-**

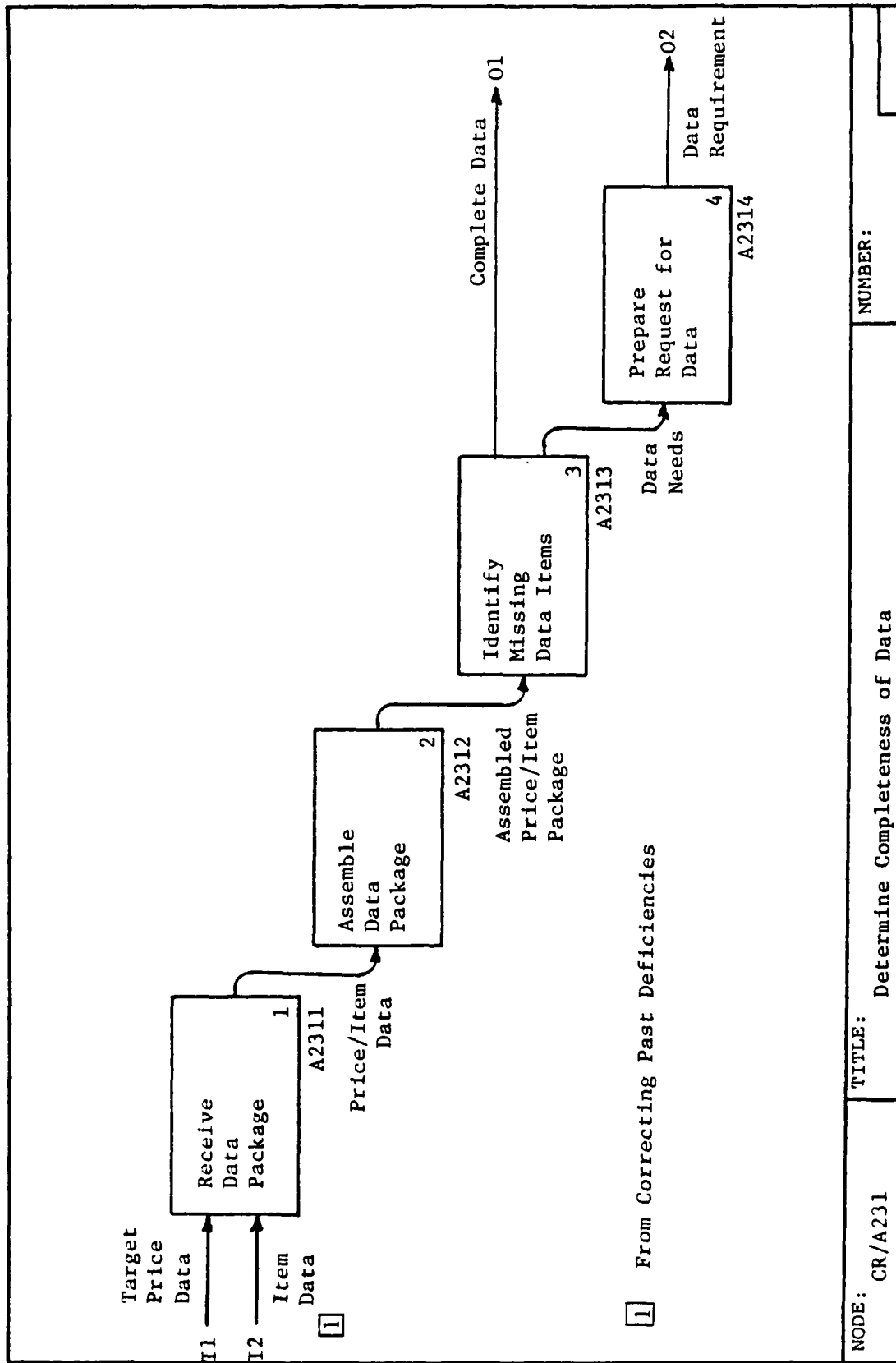






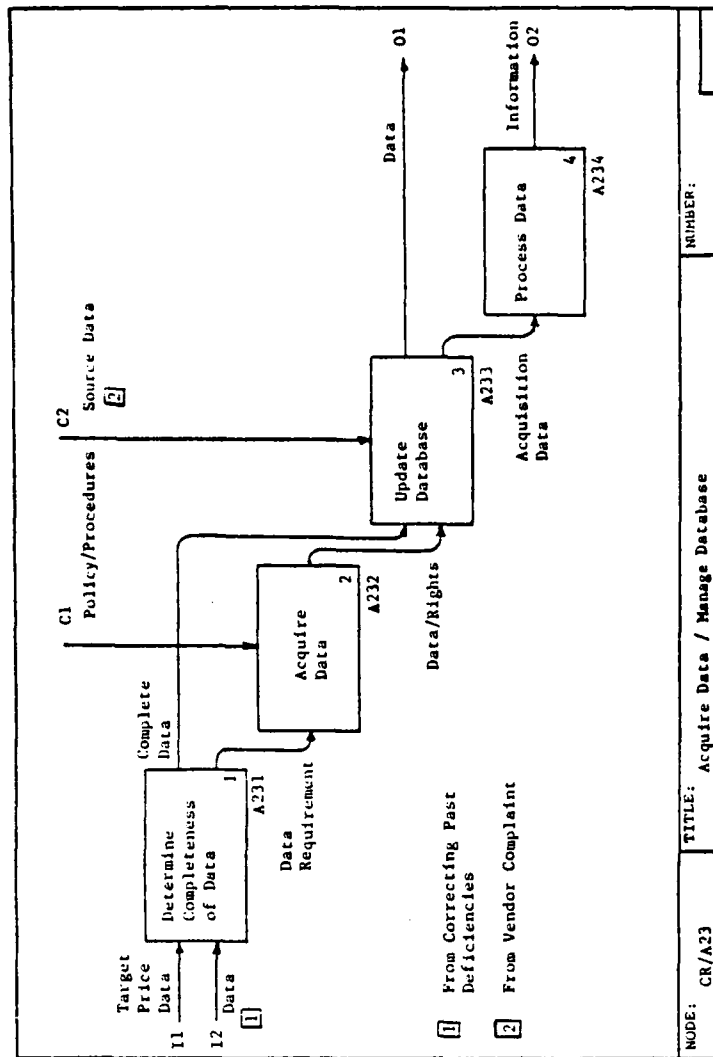
Once recieved, the data package is assembled to determine any missing data items. If the assembled data package is complete, it is forwarded for database update. Missing data items are identified and a request is then prepared to obtain them.

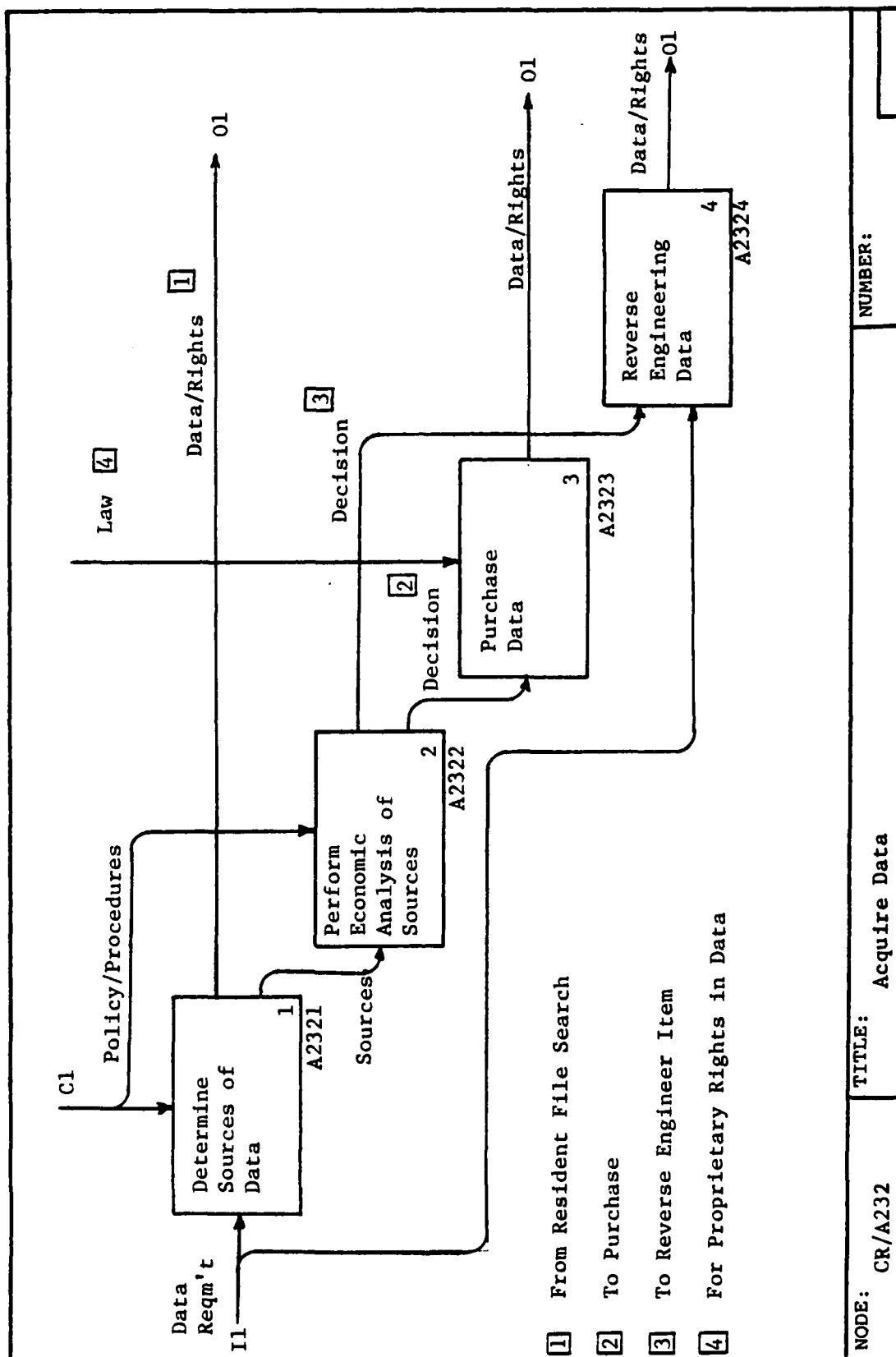




## A2.32 Acquire Data

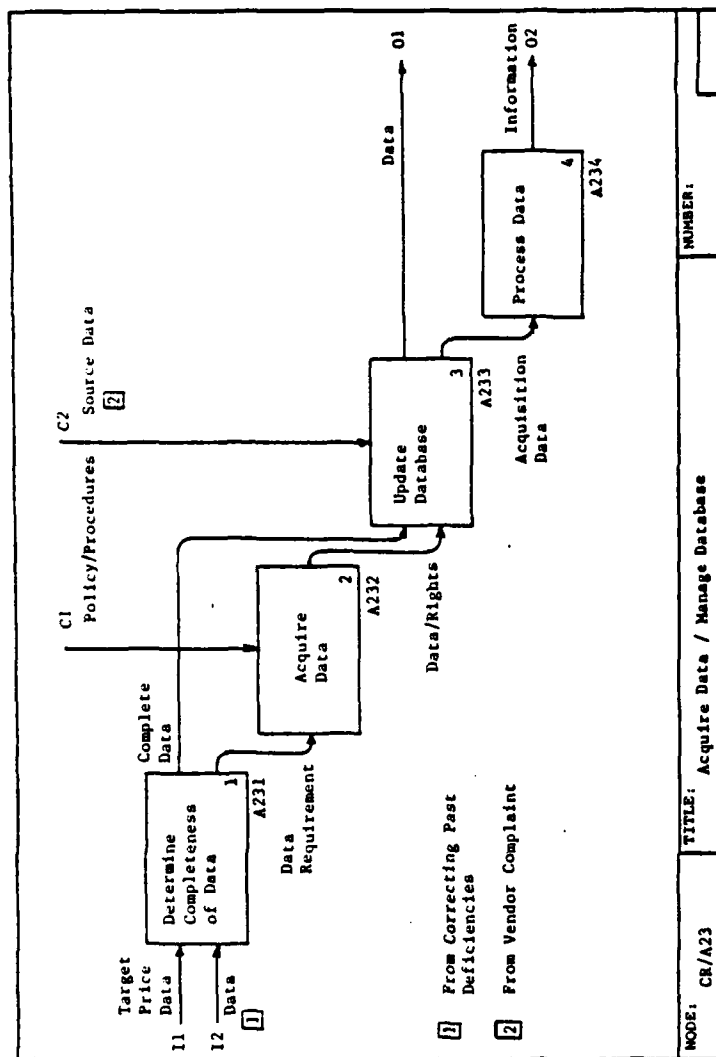
The acquisition of missing data or data rights involves a determination of the sources for the data. Once the sources are determined, an economic analysis is performed of the available sources. The results of the economic analysis can include an outright purchase of the data or a reverse engineering effort. Either approach will result in obtaining the missing information. (see A13)

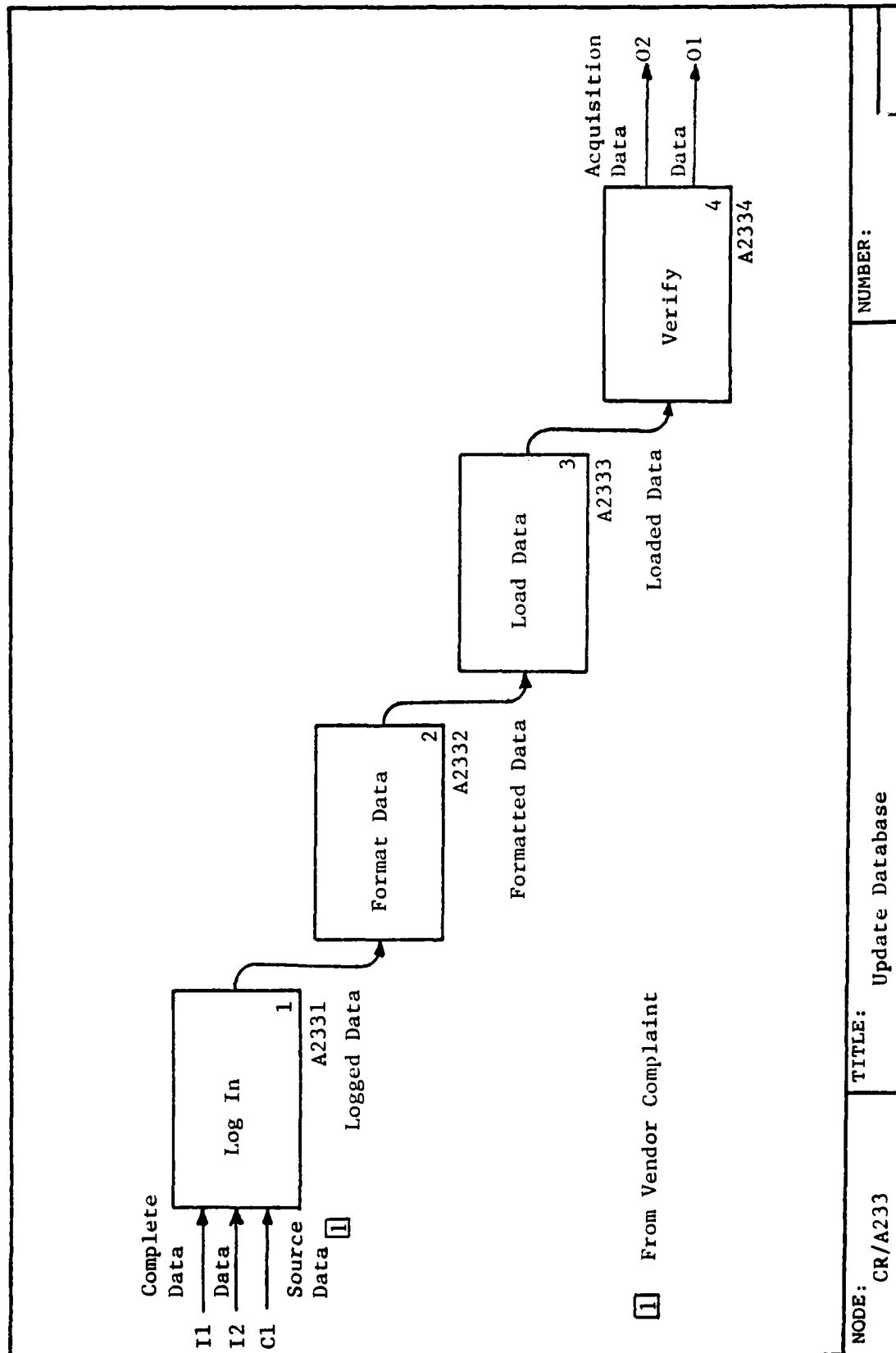




### A233 Update Database

The process of updating the database is a routine function which must be accomplished to insure that future actions requiring the acquisition data can be accurately performed. Verification is an important aspect of this process which ensures the accuracy of the database.





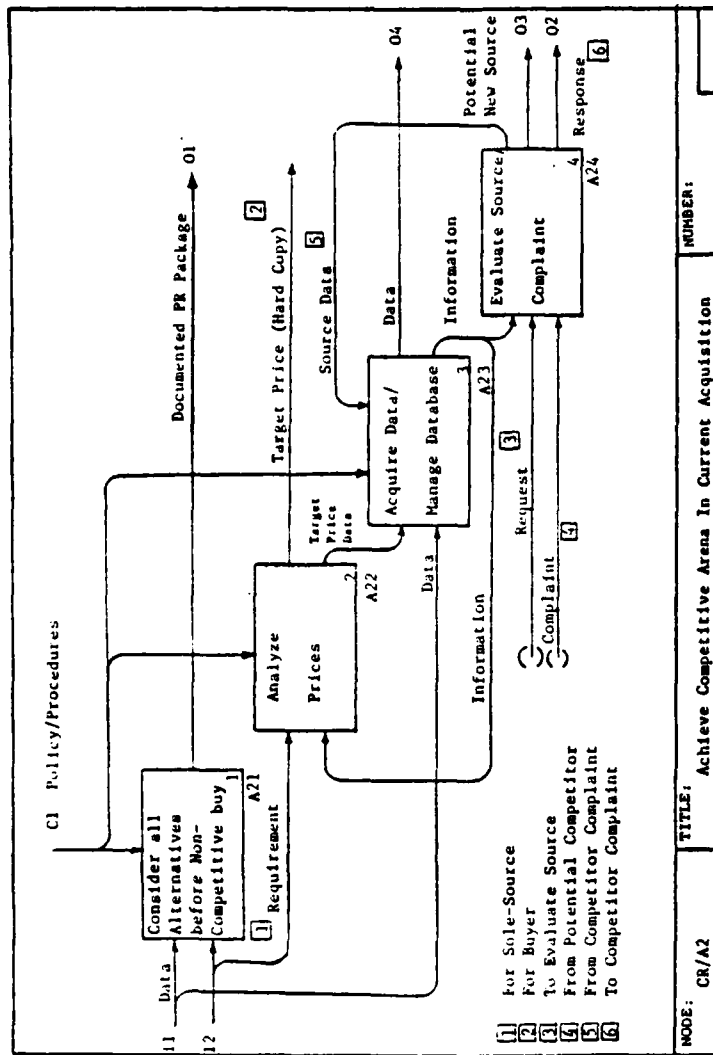
## A24 Evaluate Source/Complaint

The CR receives requirements to evaluate new sources from other organizations such as the Small Business Office. These potential new sources may be interested in bidding on current contracts. Also complaints are received from vendors that feel they have been unjustly excluded from competition as the manufacturer or supplier of an item.

When the requirement is a source evaluation, CR personnel use available information about the potential source to begin the evaluation process. If a complaint is received, the chief of the Source Development Office gathers the necessary information to process the complaint.

### Glossary

**Competitor Complaint** - Competitor complaints arise when a vendor fails to qualify as a responsive and responsible bidder, and is therefore excluded from competition for that contract.

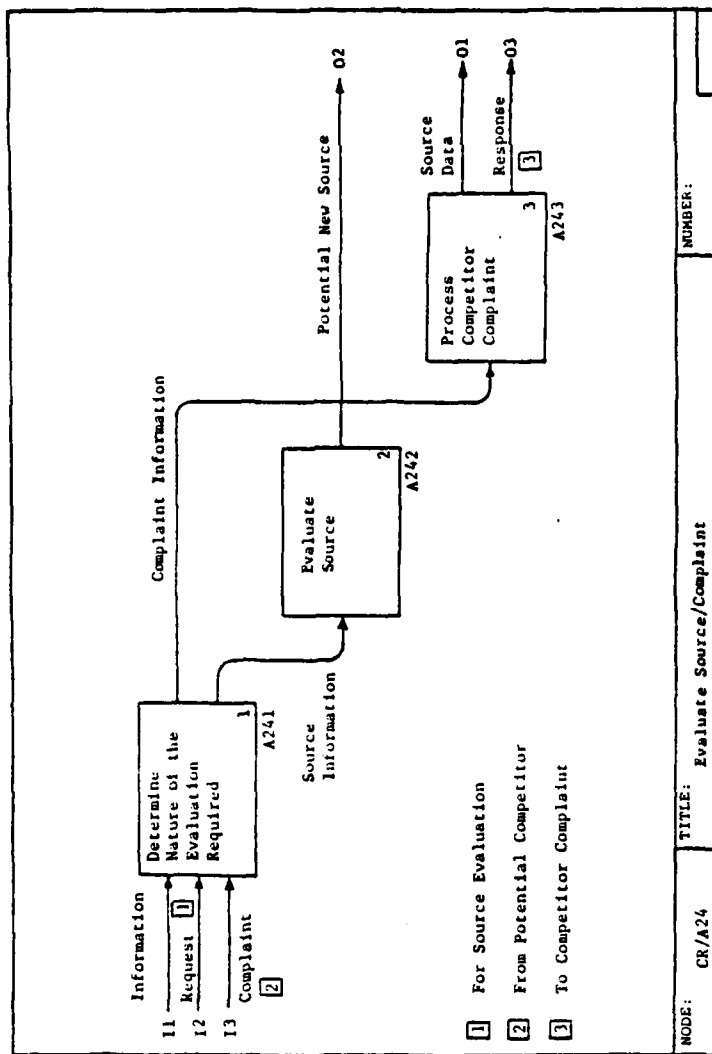


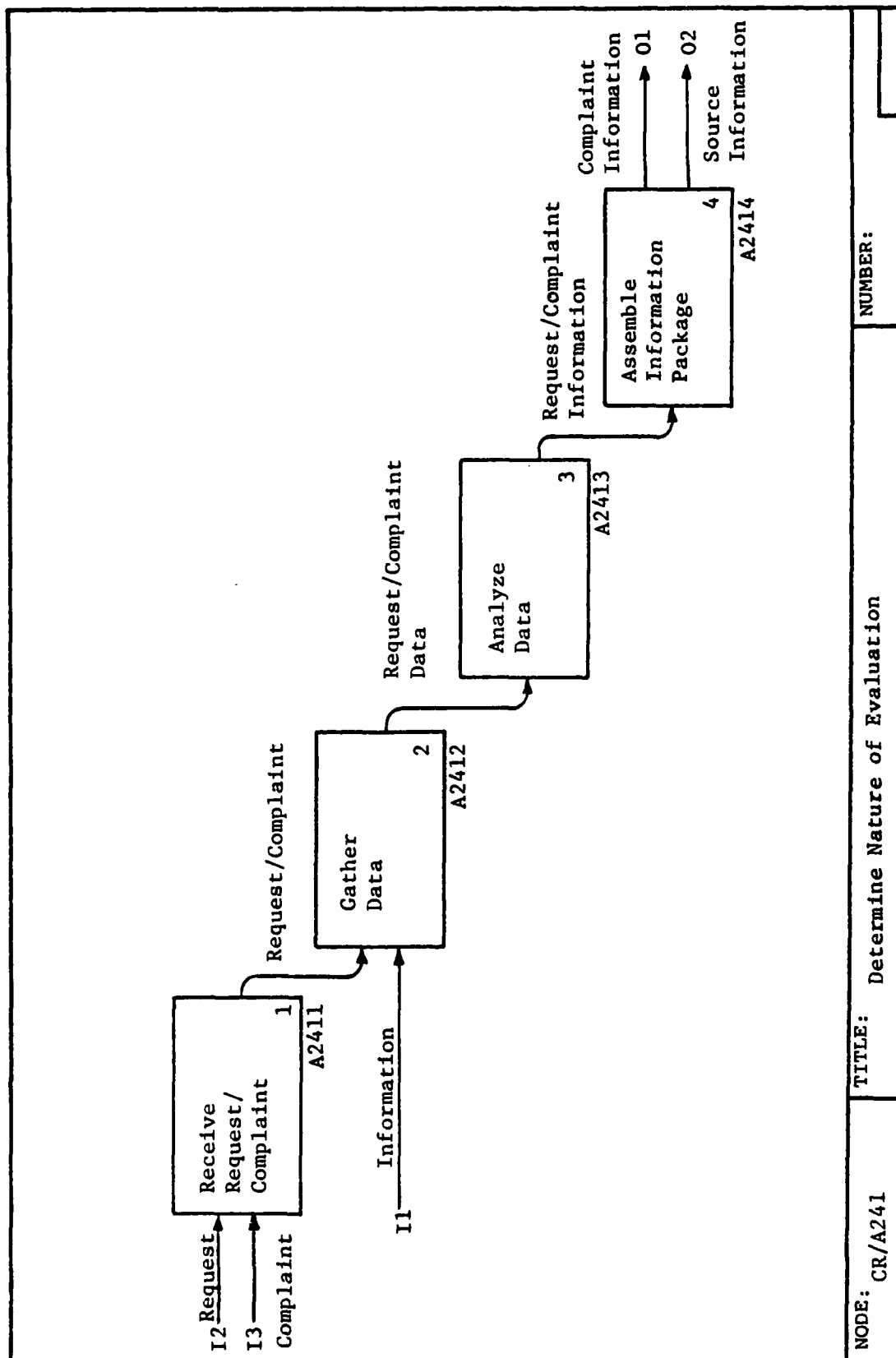




## A241 Determine Nature of Evaluation

Once the request for source evaluation or competitor complaint is received, the Engineering Data Management Division gathers data to develop a response package. The data is analyzed against information in the database and an information package is assembled for the source evaluation or competitor complaint.





NODE: CR/A241

TITLE: Determine Nature of Evaluation

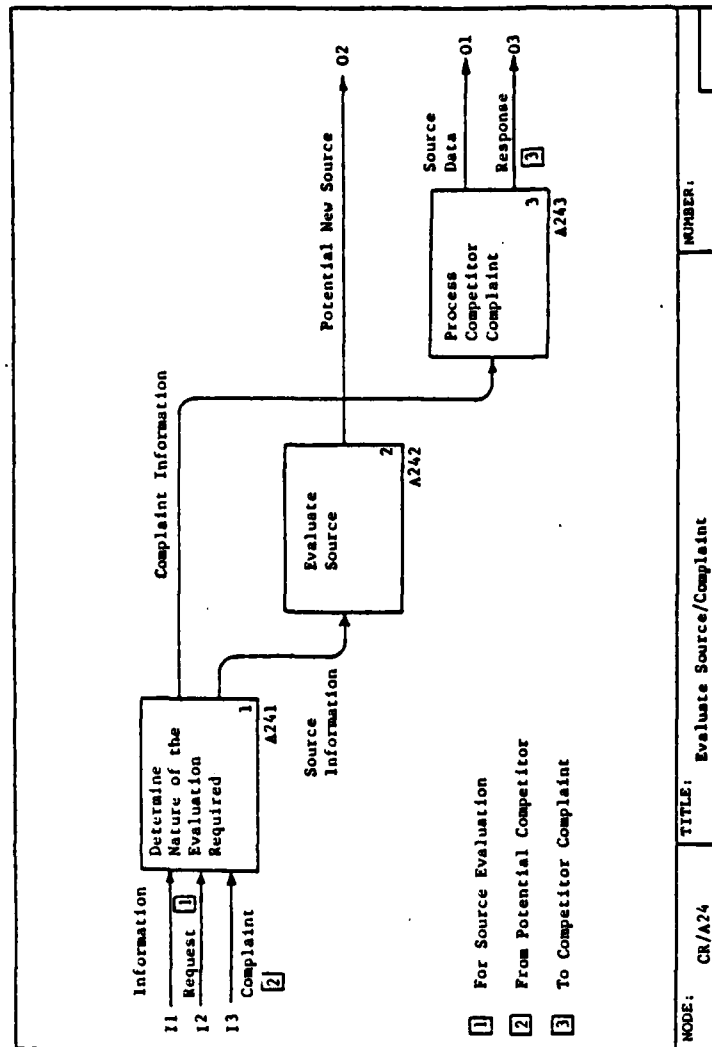
NUMBER:

## A242 Evaluate Source

Source evaluation is initiated by screening source information to determine what type of experts will be required to properly evaluate a vendor's capability. Once assembled, the source evaluation team conducts a thorough on-site evaluation of the source's capability. The results of a site evaluation visit are the identification of a potential new source or the identification of areas for improvements to enhance the source's chances for future qualification.

## Glossary

**Potential New Source** - A vendor not currently qualified to perform the requirements of a contract for a specific item. For example, a vendor currently manufacturing vehicle suspension components may not have the technical capacity to produce aircraft quality struts.



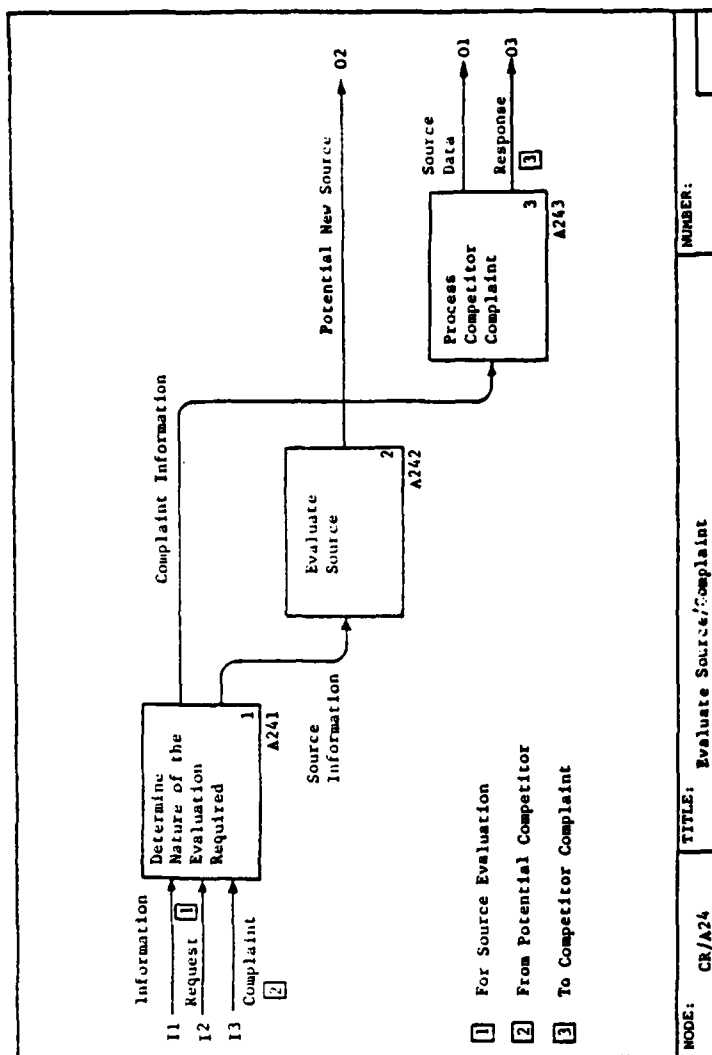


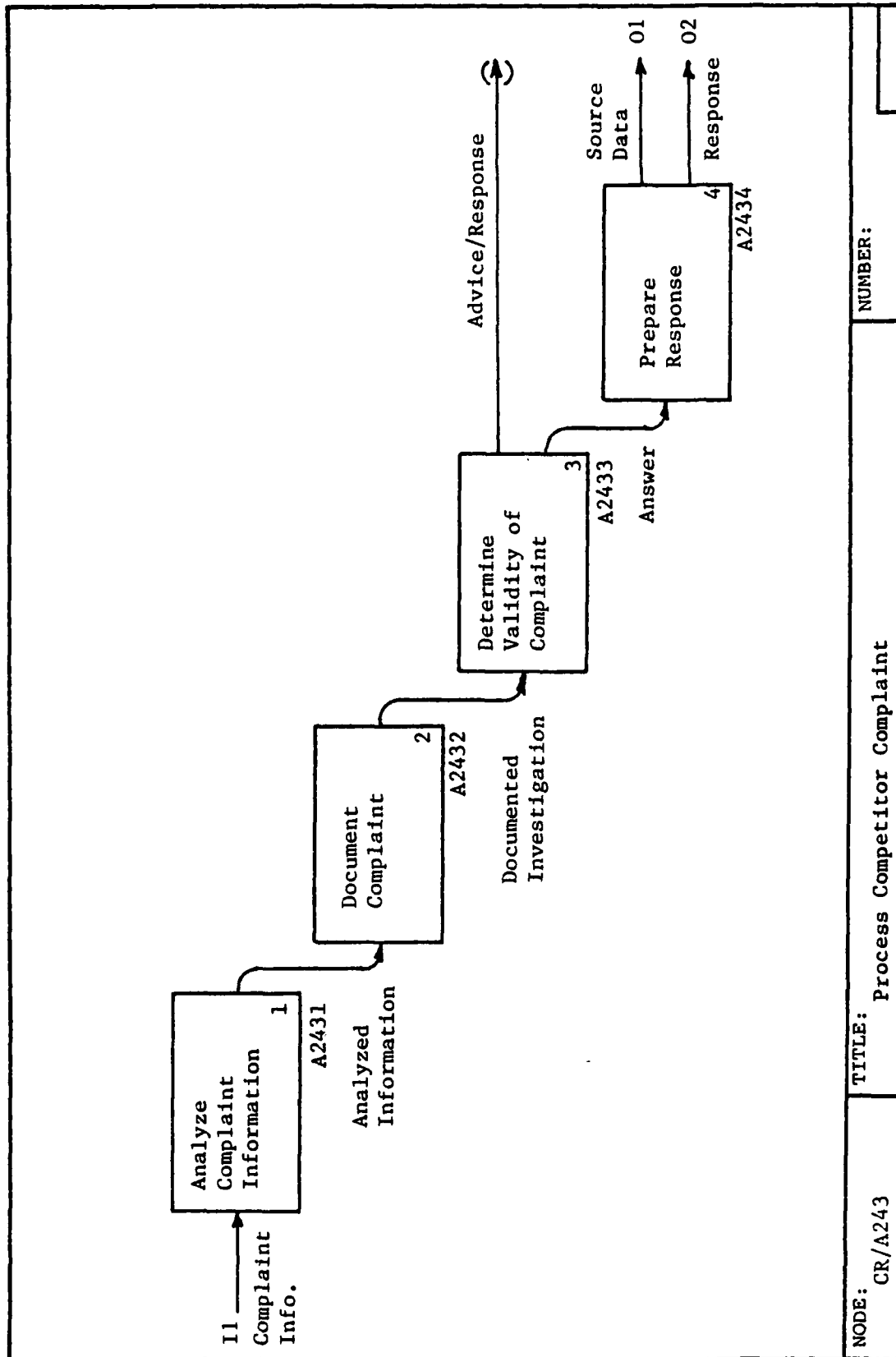
## A243 Process Competitor Complaint

The function of processing a competitor complaint begins when the information provided in the complaint and the pertinent information from the contracting functions are analyzed. The analyzed information provides the basis for documenting the complaint and establishing a determination of the complaints validity. In each case when an answer to the complaint is reached a response is prepared and communicated to the vendor concerned. Source data is often developed when it is determined that the vendor is qualified as a responsible and responsive bidder.

### Glossary

Advise - The competition advocate may provide a currently unqualified bidder with sufficient information to enable the bidder to qualify in the future.





NUMBER:

TITLE: Process Competitor Complaint

NODE: CR/A243

The flowchart illustrates the process of enhancing competition through various inputs and functional blocks. It is organized into four main stages, labeled 01 through 04 at the top.

- Stage 01: Initial Inputs**
  - Inputs: C1 (Contracts), C2 (Data), Congressional Inquiry (I1), ZOP (I1), Media Reports (I2).
  - Block 1: "Correct Past Deficiencies" (A1).
- Stage 02: Policy and Current Requirements**
  - Block 2: "Policies and Procedures" (A2).
  - Block 3: "Current Requirements" (A3).
  - Block 4: "Achieve Competitive Arena in Current Acquisition" (A4).
- Stage 03: Response and Potential**
  - Block 5: "Response to Challenger" (A5).
  - Block 6: "Potential New Source" (A6).
- Stage 04: Final Outcomes**
  - Block 7: "Documented PR Package" (A7).
  - Block 8: "Response to Competitor Complaint" (A8).
  - Block 9: "Enhance Future Competition" (A9).
  - Block 10: "Management Information" (A10).

The flow of information is as follows:

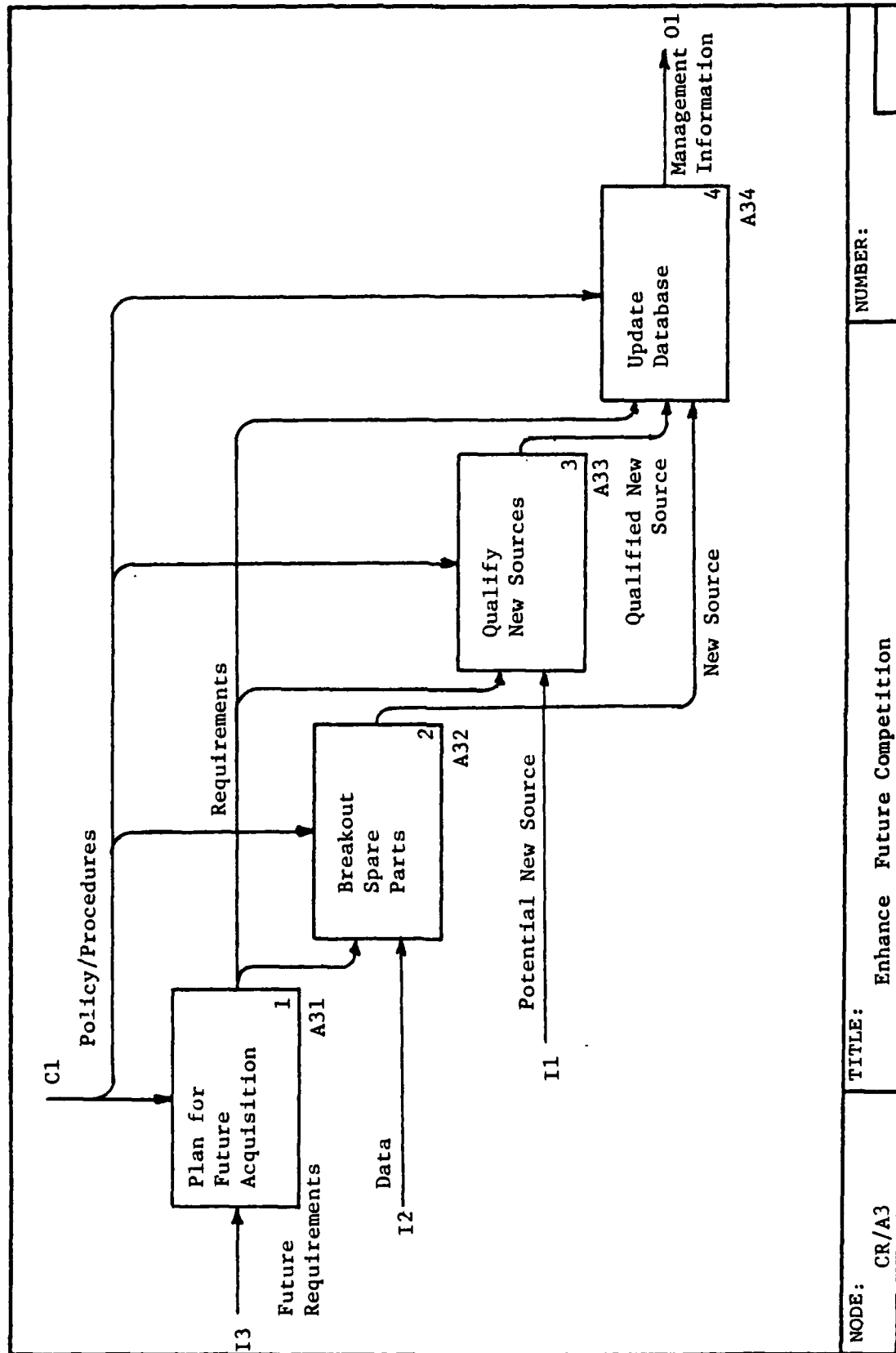
- Inputs C1, C2, I1, and I2 feed into Block 1.
- Block 1 feeds into Block 2.
- Block 2 feeds into Block 3.
- Block 3 feeds into Block 4.
- Block 4 feeds into Block 5.
- Block 5 feeds into Block 6.
- Block 6 feeds into Block 7.
- Block 7 feeds into Block 8.
- Block 8 feeds into Block 9.
- Block 9 feeds into Block 10.

Feedback loops are indicated by arrows from Block 10 back to Block 1, and from Block 10 back to Block 2.

**requirements to did competitively on future buys.**

**Qualified New Source - In this context a potential new source (supplier) that has satisfied the necessary requirements to bid competitively on future buys.**

all product dimensions. Frequently a follow-on buy of spare parts involves competition of price only.



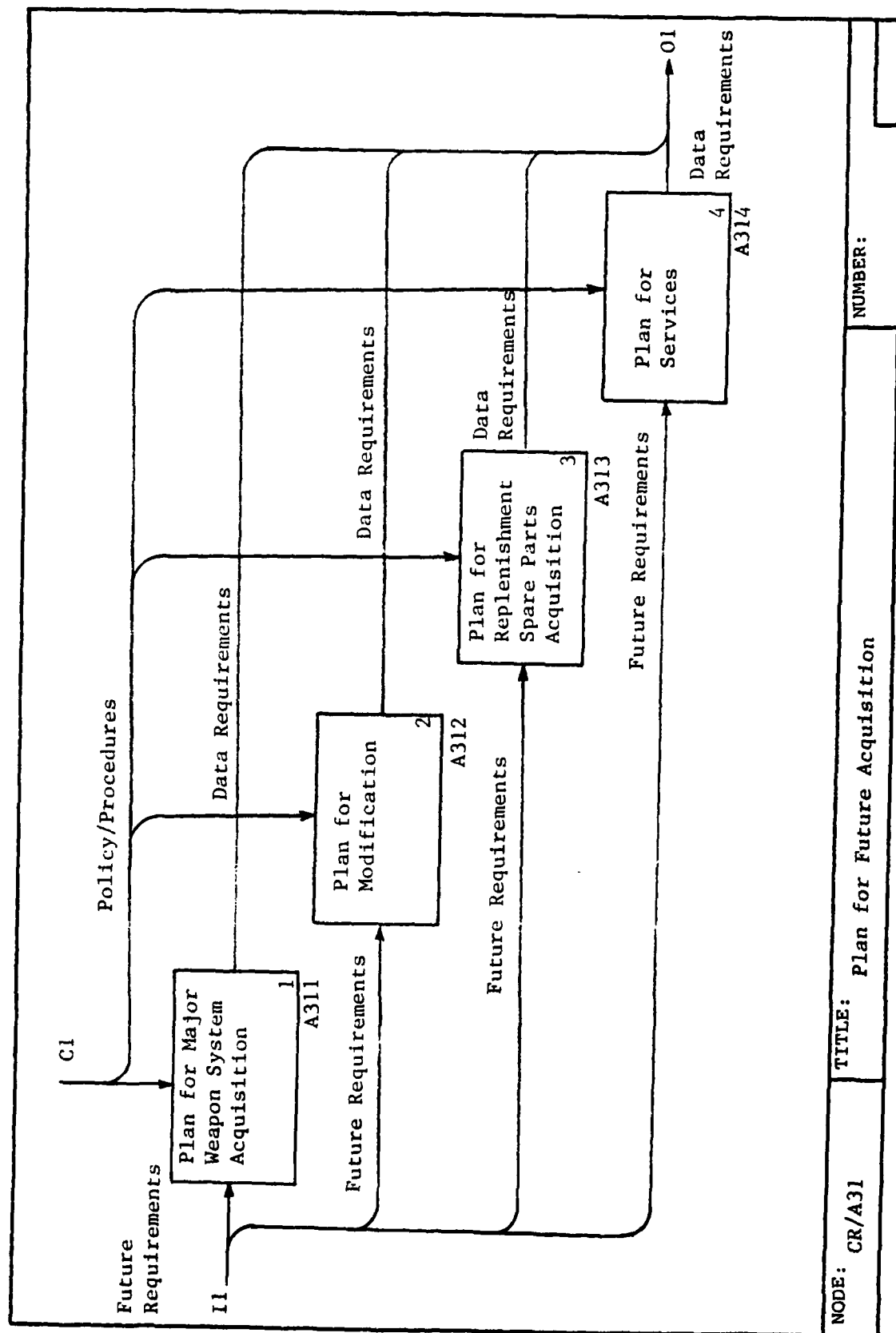


```

graph TD
    C1[CI] --> PFA[Plan for Future Acquisition 1 A31]
    PFA --> P[Policy/Procedures]
    P --> PFA
    P --> R[Requirements]
    R --> PFA
    R --> BSSP[Breakout Spare Parts 2 A32]
    BSSP --> PFA
    BSSP --> PNS[Potential New Source 3 A33]
    PNS --> PFA
    PNS --> QNS[Qualify New Sources 3 A33]
    QNS --> PFA
    QNS --> QNS
    QNS --> NS[New Source]
    NS --> PFA
    NS --> UDB[Update Database 4 A34]
    UDB --> PFA
    UDB --> UDB
    UDB --> MI[Management Information]
    
```

The flowchart illustrates the Future Acquisition Process (A31). It begins with 'CI' (Control Interface) feeding into the 'Plan for Future Acquisition' block (A31). This block is also influenced by 'Policy/Procedures' and 'Requirements'. The 'Plan for Future Acquisition' block outputs 'Future Requirements' (I13) and 'Data' (I12). 'Data' (I12) feeds into the 'Breakout Spare Parts' block (A32). 'Requirements' also feed into the 'Breakout Spare Parts' block. The 'Breakout Spare Parts' block outputs 'Potential New Source' (I1) and 'Qualify New Sources' (A33). 'Potential New Source' (I1) feeds into the 'Qualify New Sources' block. 'Qualify New Sources' (A33) outputs 'New Source' and 'Update Database' (A34). 'New Source' feeds into the 'Update Database' block. 'Update Database' (A34) outputs 'Management Information' and 'Update Database' (A34). 'Update Database' (A34) also feeds back into the 'Plan for Future Acquisition' block.

The planning process for future acquisitions is dependent upon the type product that will be purchased. Future acquisitions can be in the form of major weapon system purchase, weapon system modification, replenishment spare parts acquisition, or service needs. In each case the planning process analyzes the future requirements to determine what the data requirements will be. Planning for future acquisition data requirements should preclude the task of obtaining acquisition data when the need arises in the future.

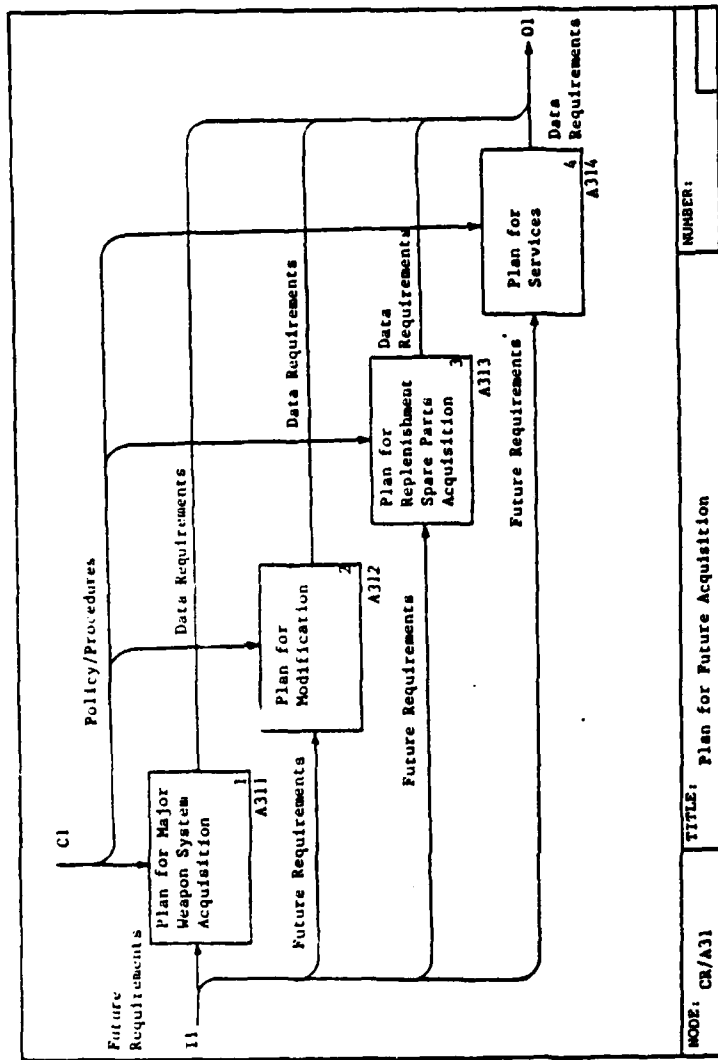


### A311 Plan For Major Weapon System Acquisition

Although the ALC is not directly responsible for major weapon systems acquisition, it assumes responsibility for logistics support once the weapon system is operational. Therefore, it is imperative that the support requirements be identified as early as possible in the development phase. This planning for future weapon systems includes coordination with AFSC and the using command, a review of contract proposals, and the identification of engineering data deficiencies. The result of these early efforts should prevent data short-falls when actual support purchases are made, and insure that proper competition initiatives are considered.

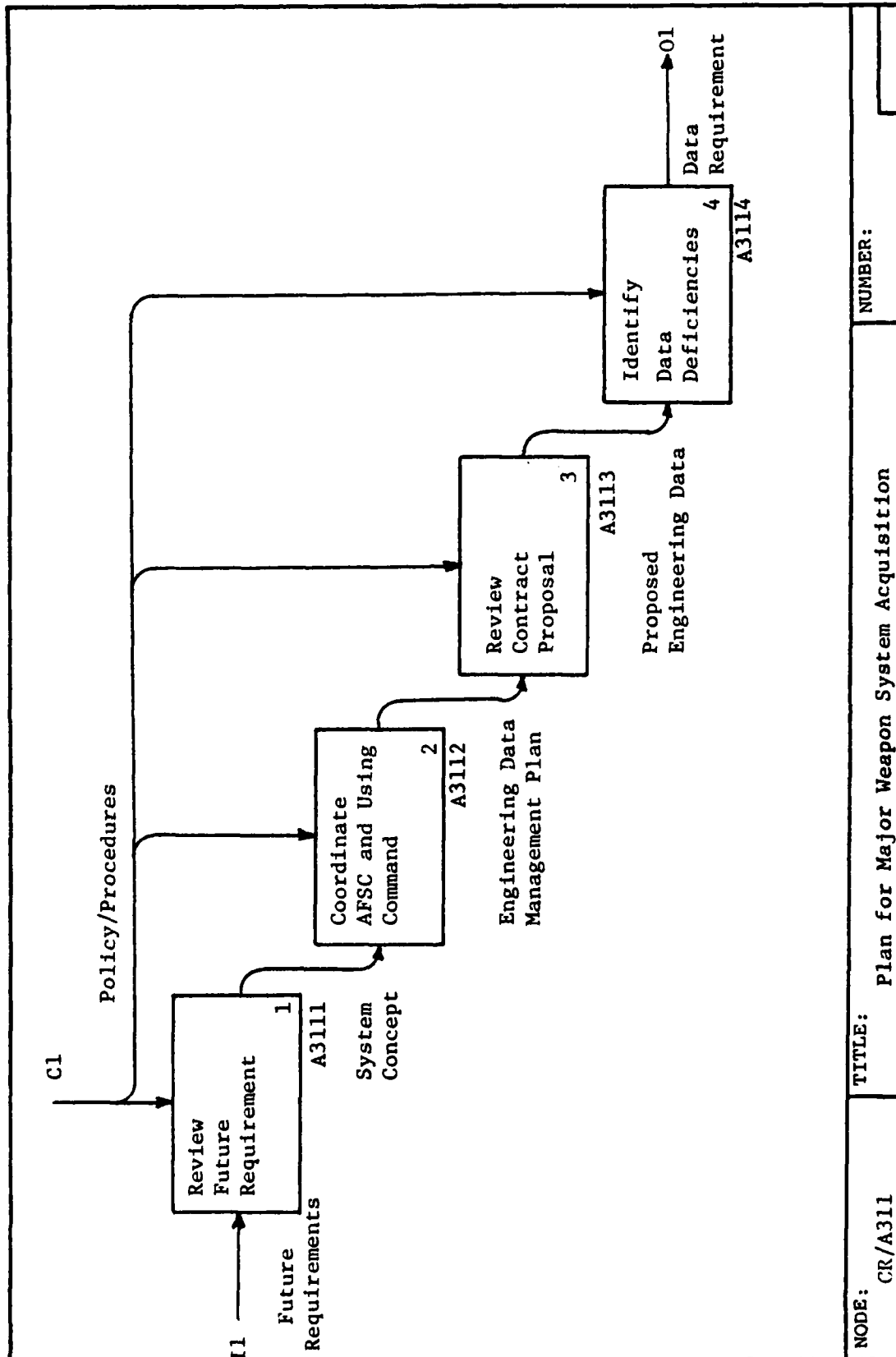
### Glossary

Policy/Procedures - Significant policy and procedural constraints are imposed by Military Specifications, acquisition regulations, and program management



directives.

Engineering Data Management  
Plan - This describes the management strategy for acquiring complete and accurate engineering data to support the system, subsystem, or equipment being purchased.



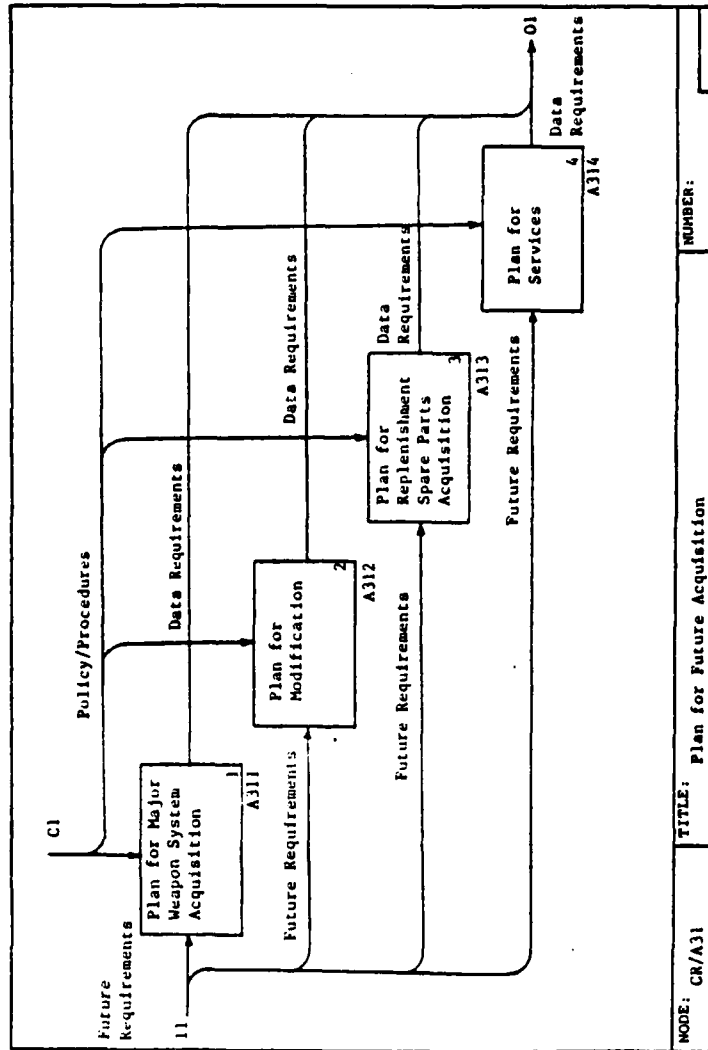
## A312 Plan for Modification

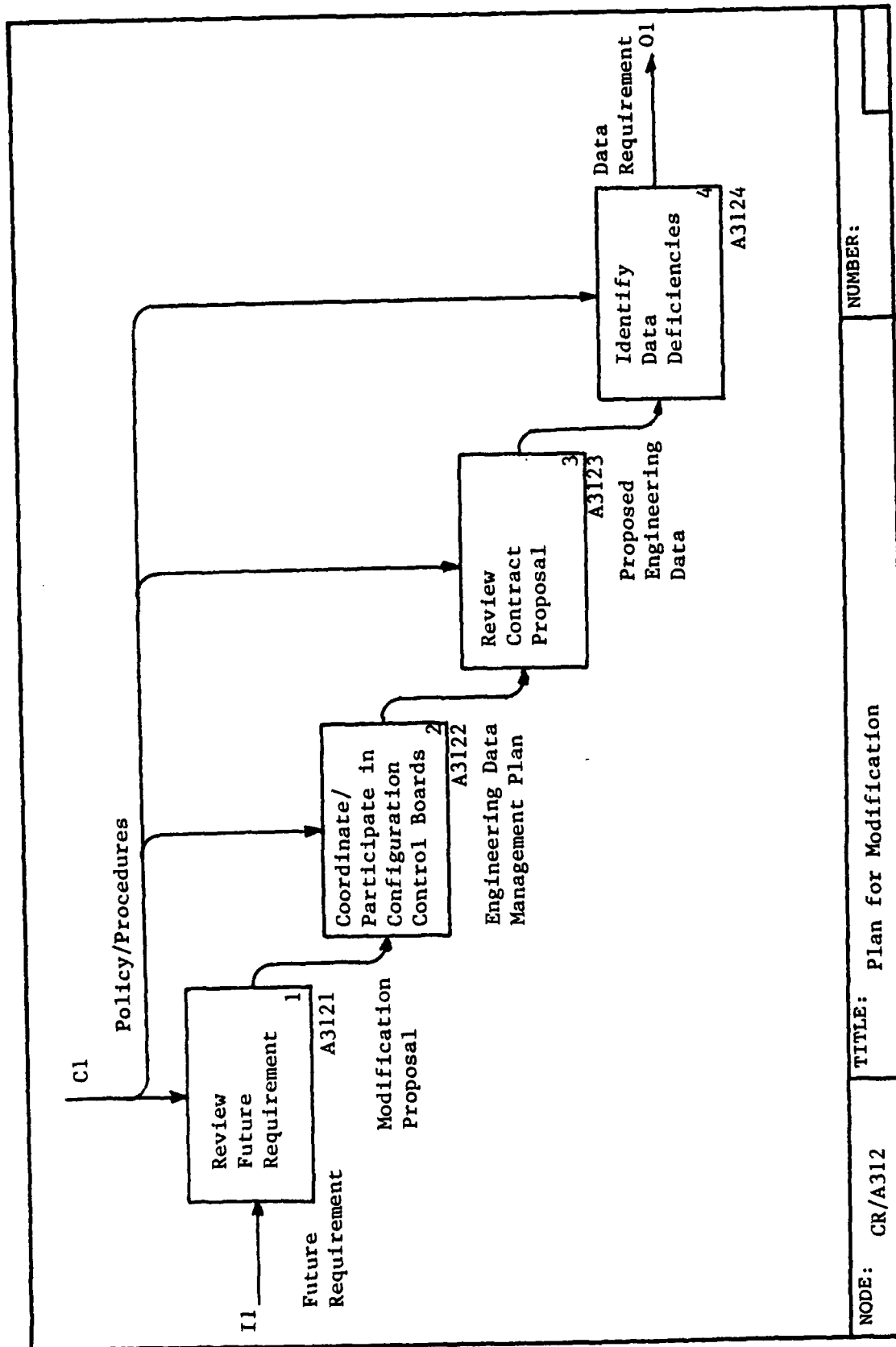
A comprehensive plan for weapon system modification is essential to avoid short-falls in engineering data. To determine engineering data requirements, the CR directorate participates in Configuration Control Board meetings to identify the logistics support requirements. Once identified, the contract proposals are reviewed and acquisition data deficiencies are identified. These data deficiencies are then used to forecast any data requirements.

## Glossary

### Configuration Control Board -

A committee formed to ensure that all logistics support requirements are considered when determining configuration changes to major weapon systems.





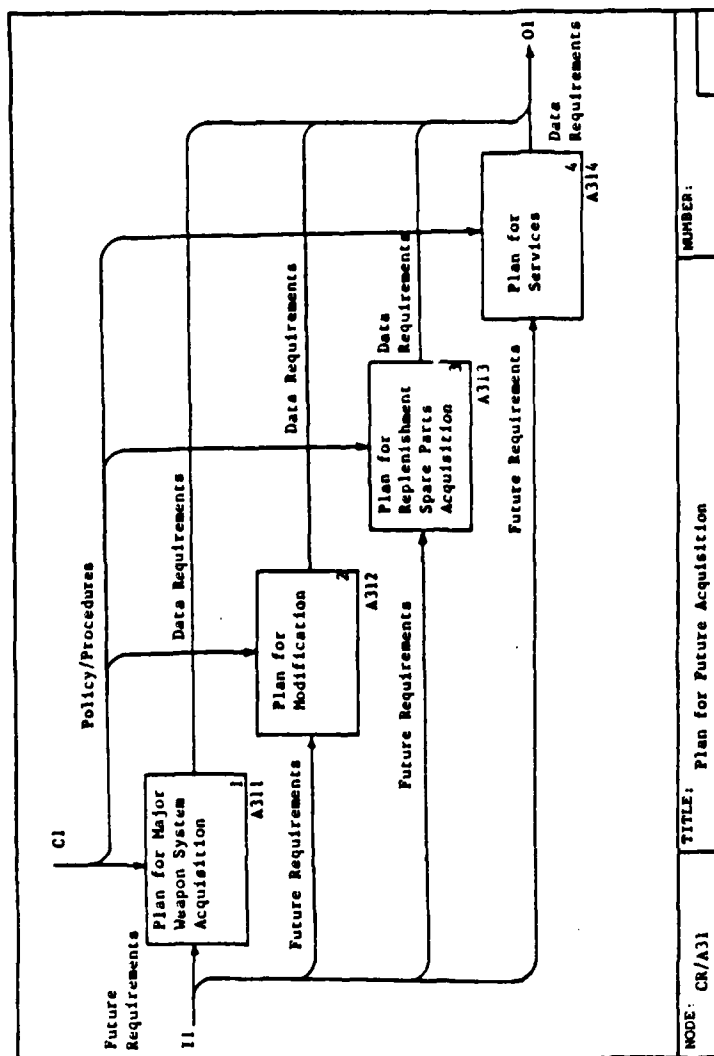
### A313 Plan For Replenishment Spares Acquisition

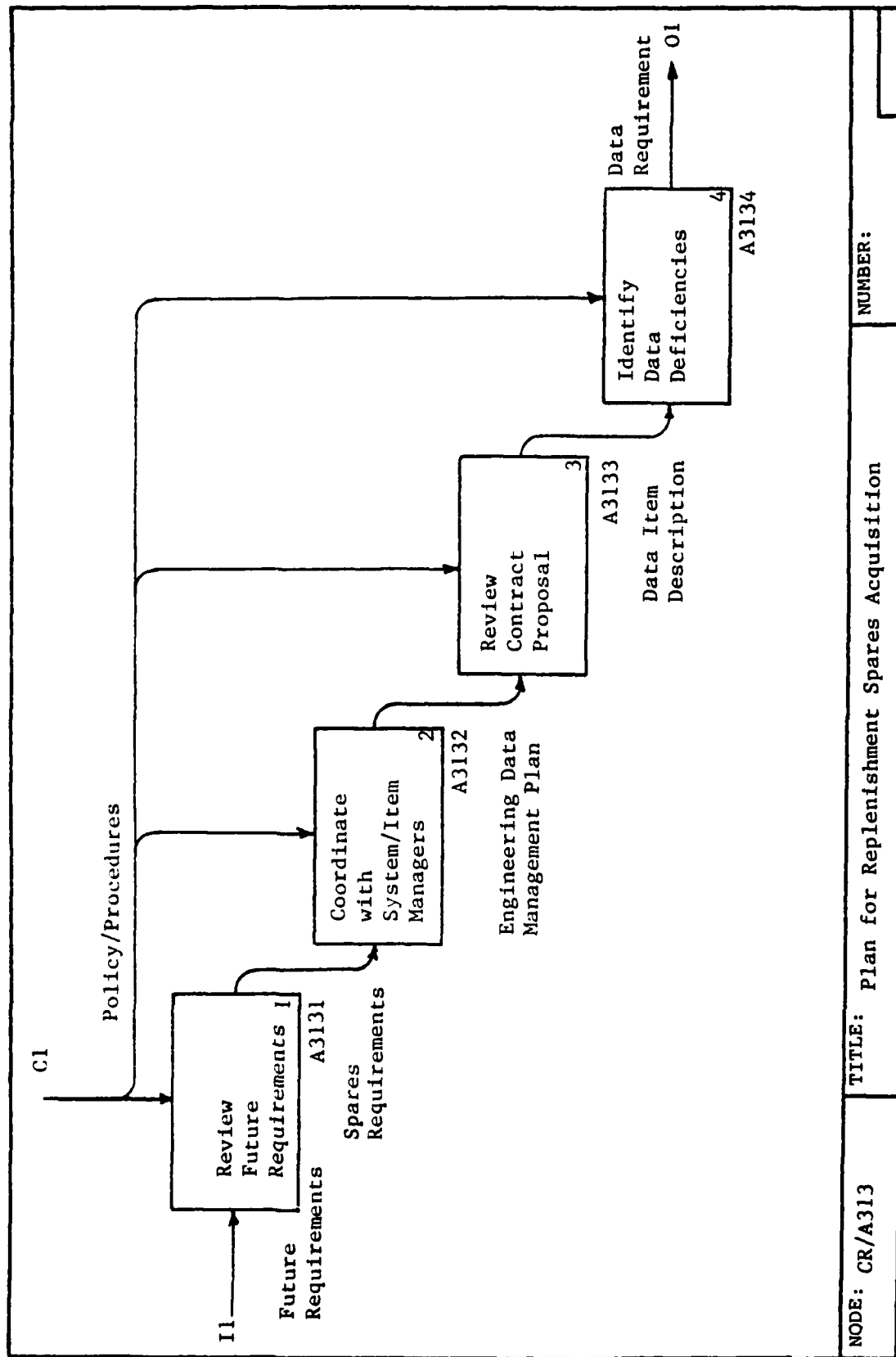
Planning for replenishment spare parts acquisition requires an accurate assessment of future operational requirements for new and existing weapons systems. When spare parts requirements are developed, close coordination with the System/Item Managers enables the Directorate of Competition Advocacy to assist in developing a comprehensive DMP. This advance involvement ensures that contract proposals can be reviewed for adequate Data Item Description thus enabling data deficiencies to be identified.

### Glossary

#### Data Item Description (DID) -

Each type of data to be delivered by a contractor has a DID number assigned. Each DID advises the contractor what data is to be furnished, how it should be developed, and the format to be used in submission of data.

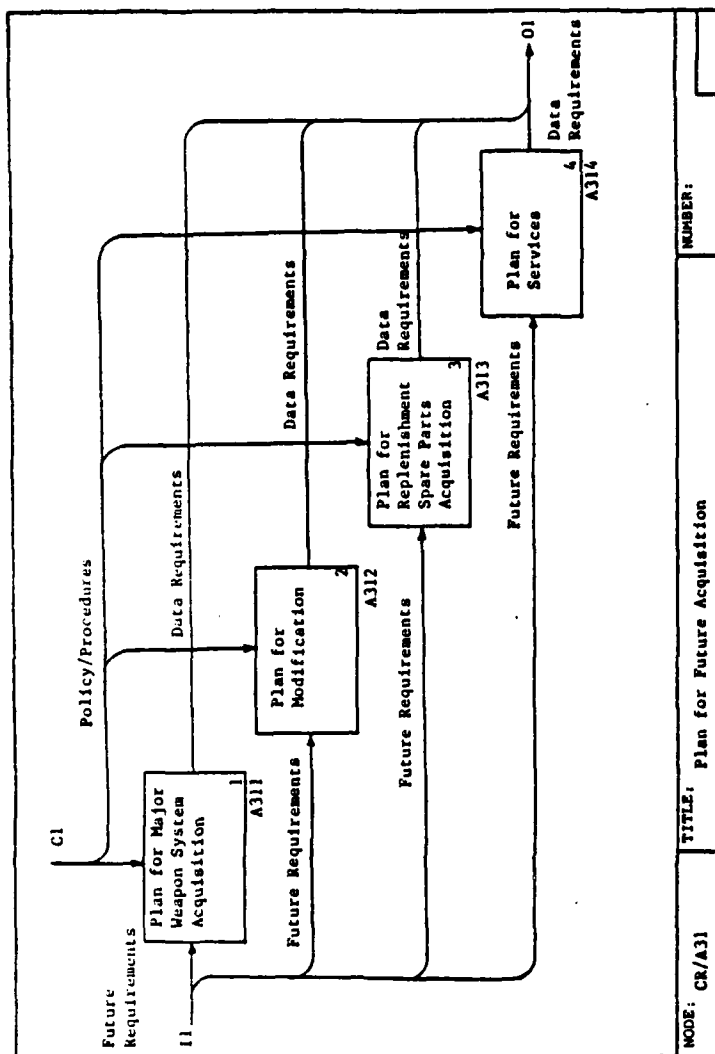


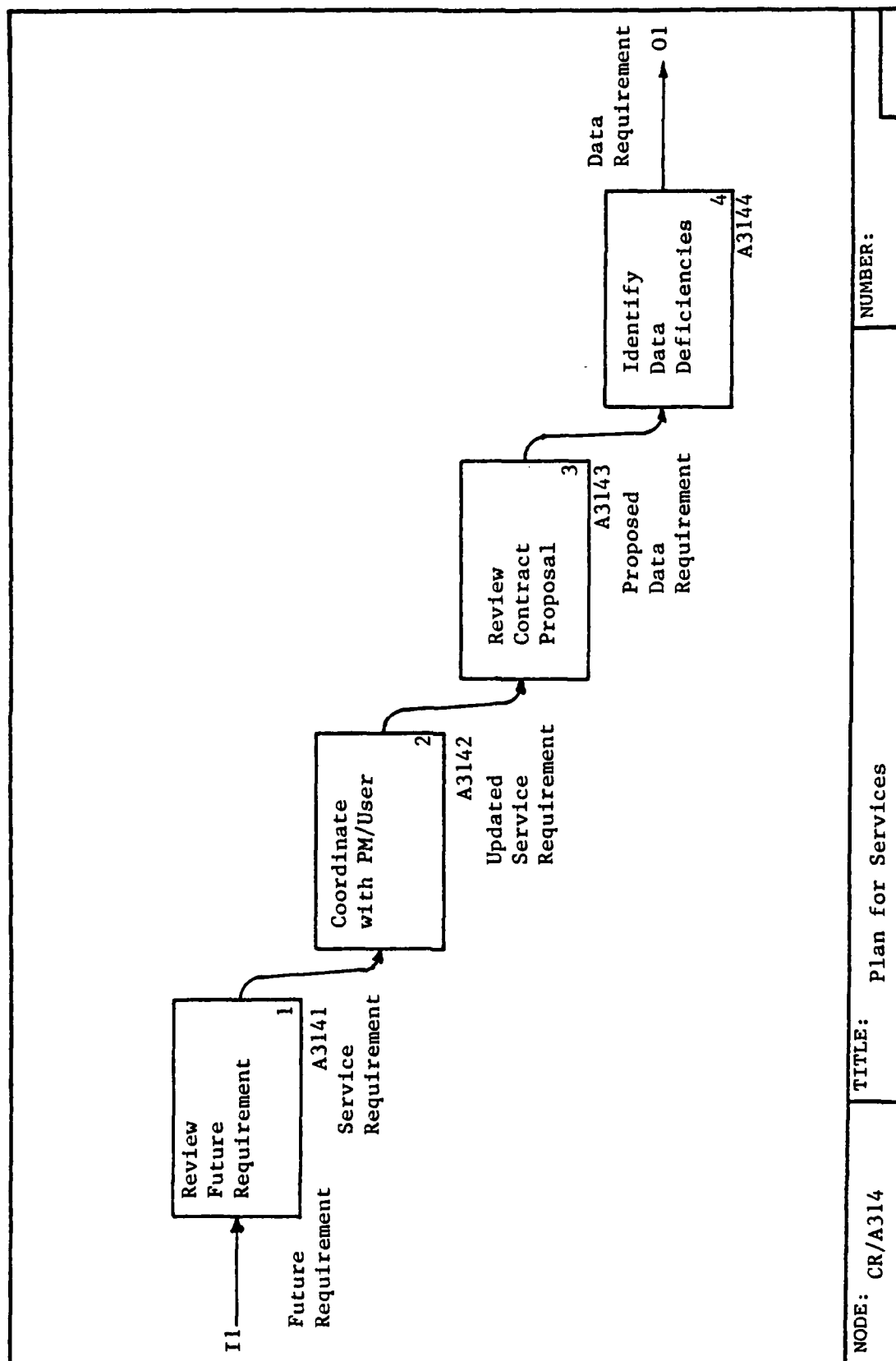




### A314 Plan For Services

Planning for future service requirements involves a comprehensive review to determine the specific service requirements. The identification of service data deficiencies or requirement is similar to the process of identifying other future data requirements, (A311, A312, A313). However, future service needs also involves evaluation of organizational capabilities to determine whether to buy (contract out) needed services or to develop an internal organizational capability.



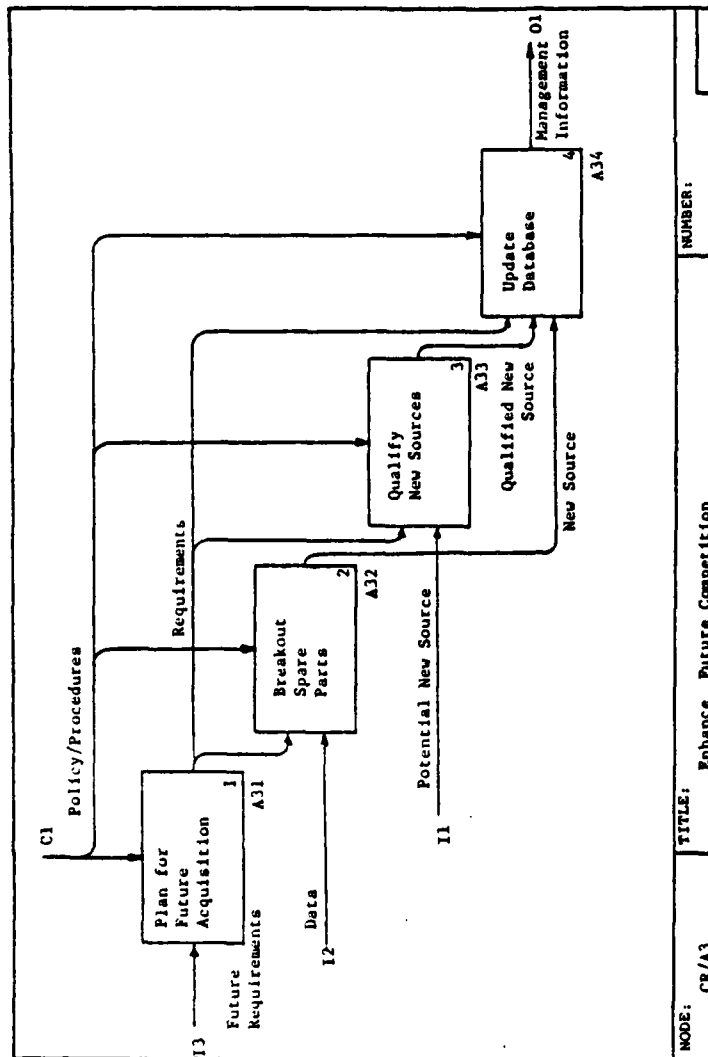


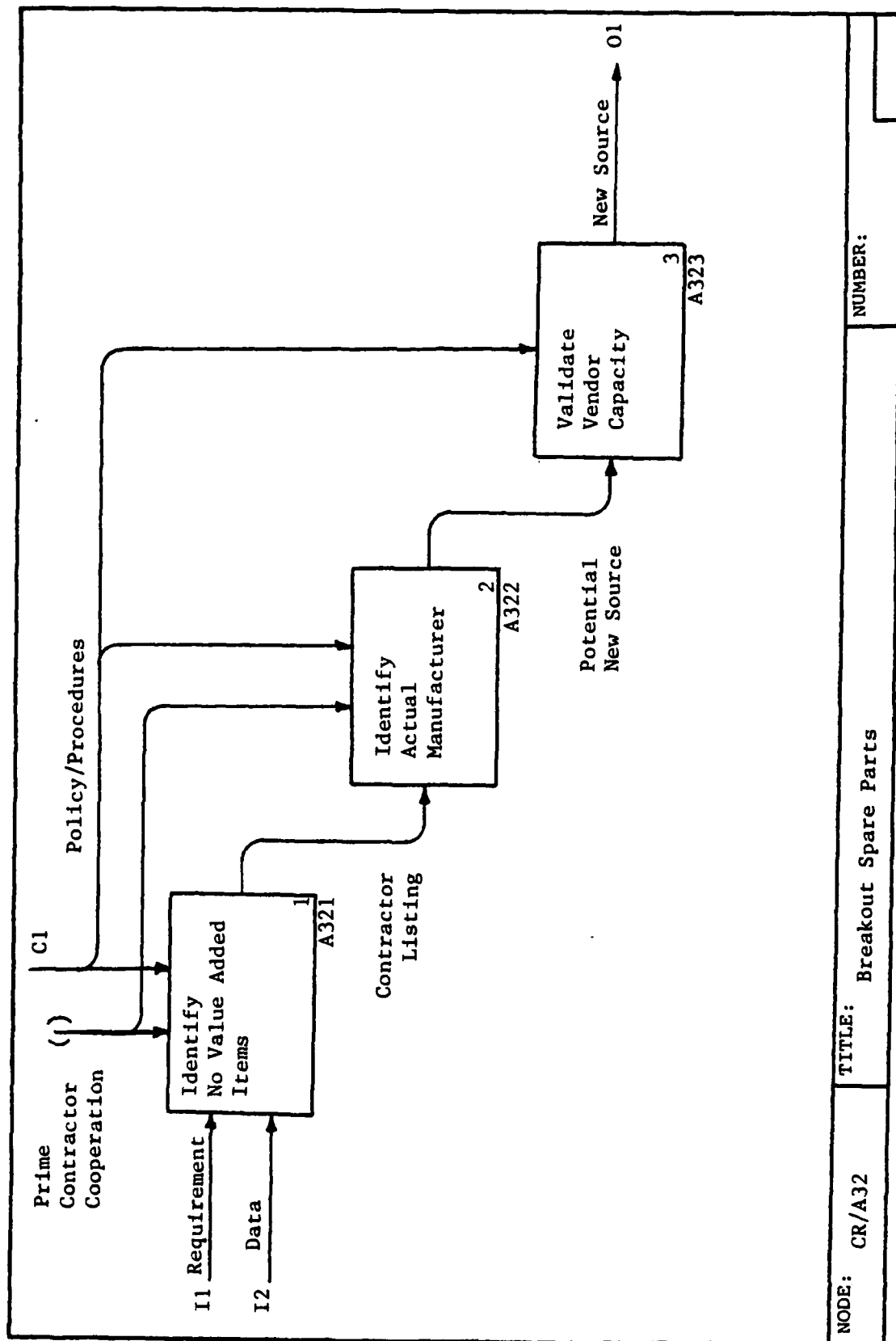
## A32 Breakout Spare Parts

The Spare Parts Breakout process is accomplished in response to the direction in supplement 6 to the DoD supplement to the Federal Acquisition Regulation. This process takes item requirements and available data to develop a list of parts to which the prime contractor adds no value. From this list of parts, the actual vendor that supplied the item to the prime contractor is identified. Once the original sources are identified, their capacity to supply directly to the government is validated and a new source is produced. The co-operation of prime contractors in this process is essential since it enables the Competition Advocate to easily and effectively achieve new source qualification.

### Glossary

Prime Contractor - The contractor which has or had overall responsibility for production of a weapon system.

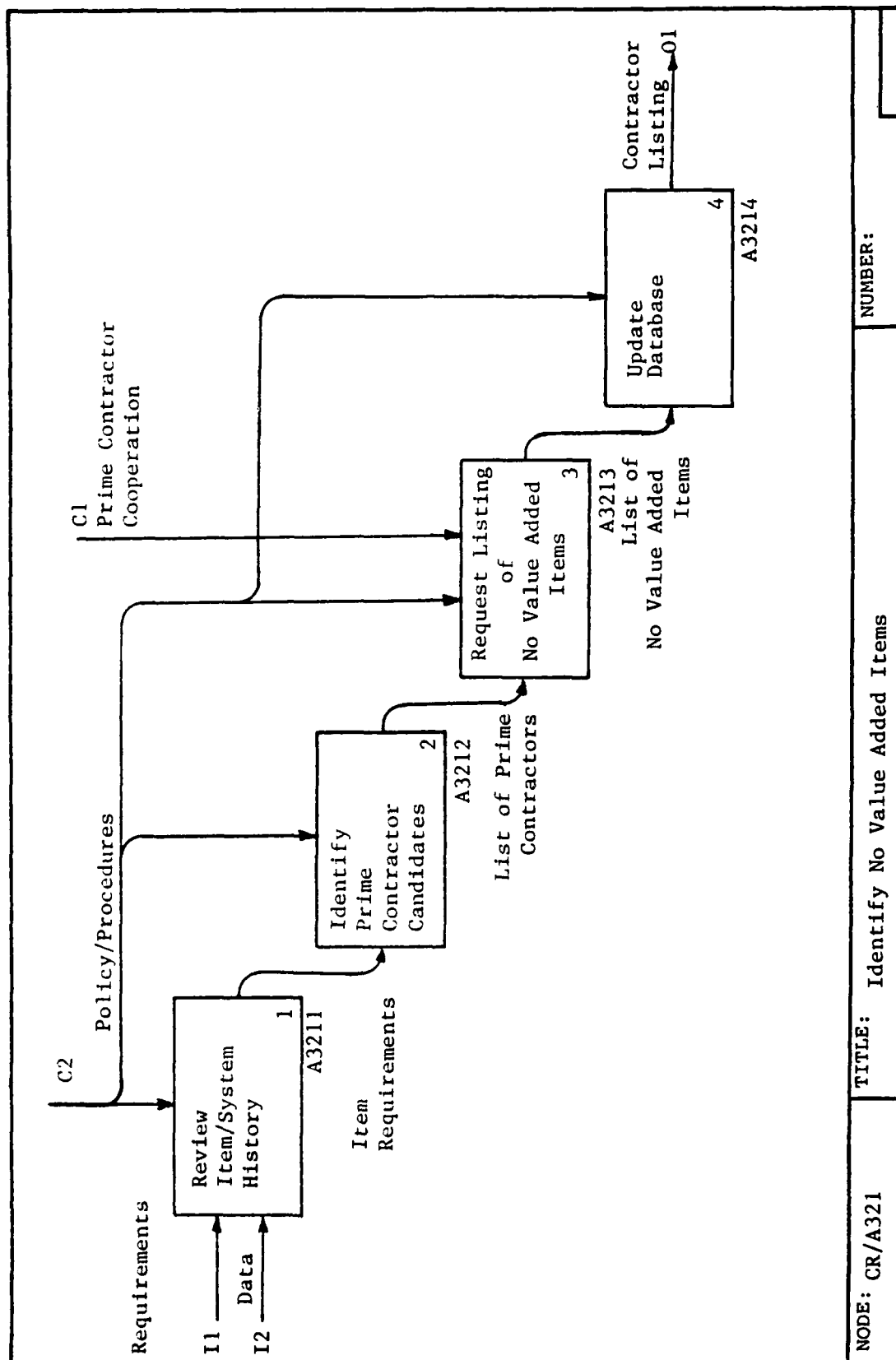




This process begins with a review of item or system histories for spare parts which will be required to support systems in the Air Force inventory. Once requirements are determined, the prime contractor that supplied the item to the Air Force is identified. A listing of no value added items is then requested from the prime contractor and the data base is updated. With the cooperation of prime contractor, numerous items have been identified.

No Value Added Item - A part or component which is purchased from a prime contractor that is actually produced by a subcontractor or vendor. The prime contractor's processing of the part adds no value to the item.





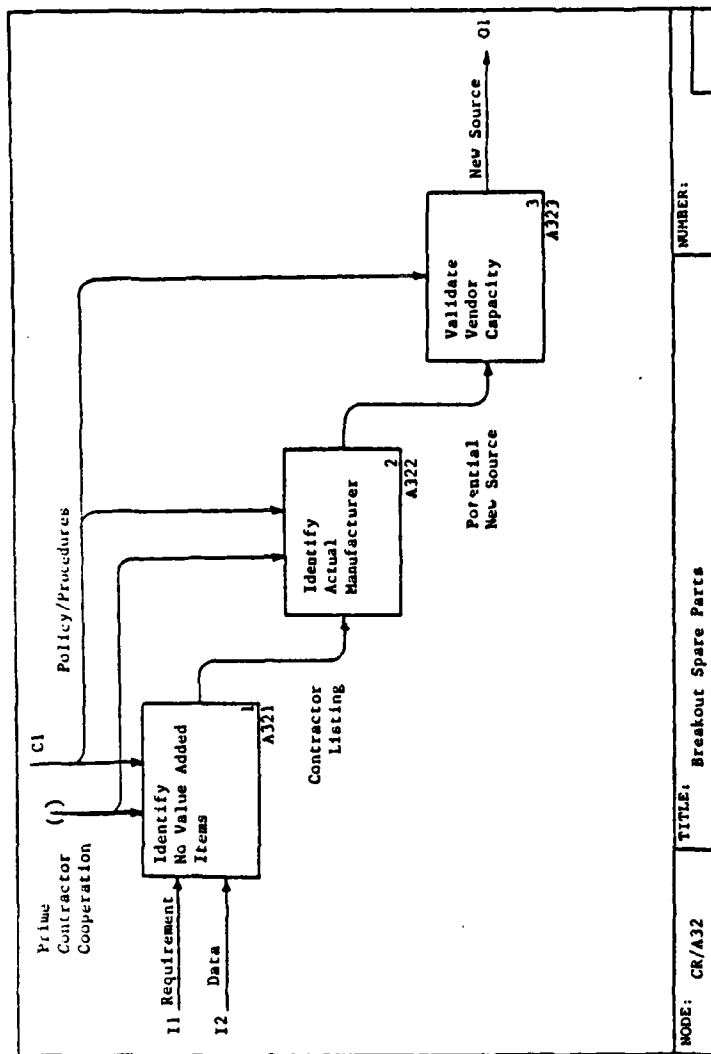
NODE: CR/A321

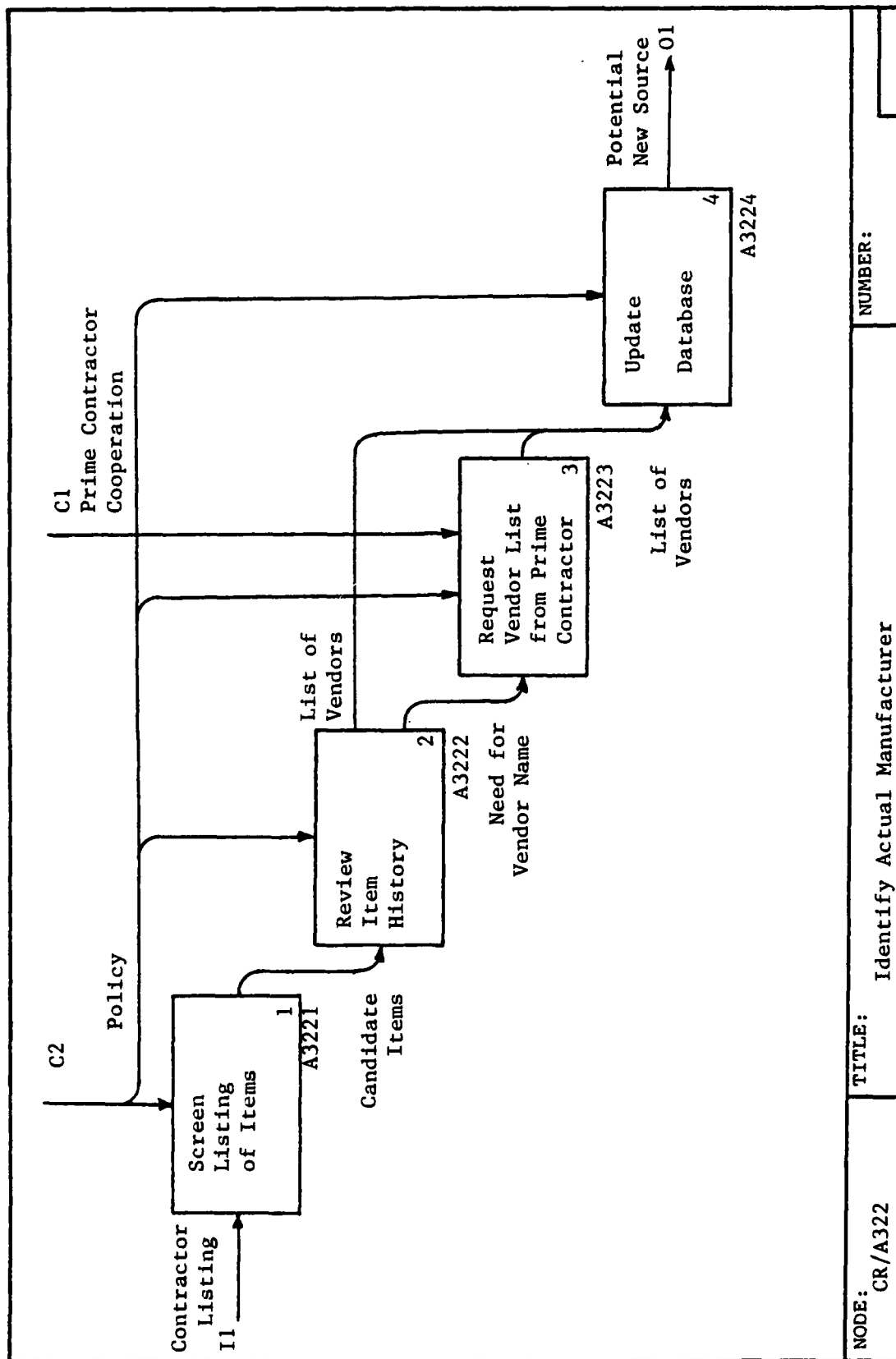
TITLE: Identify No Value Added Items

NUMBER:

# A322 Identify Actual Manufacturers

Once the listing of items for break-out is obtained, the list is screened to determine if engineering data is available for competitive purchase. Should the name of the vendor or manufacturer be missing, a request is sent to the prime contractor to obtain the required information. When all vendor information is complete, it is entered into the database as a source for future competition.

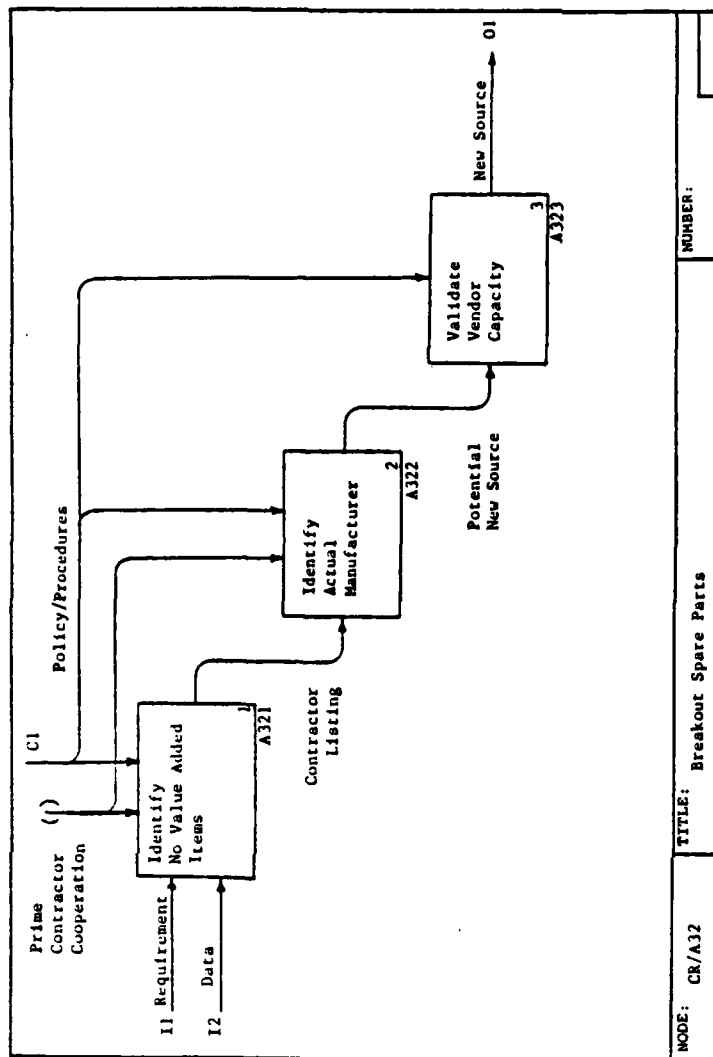


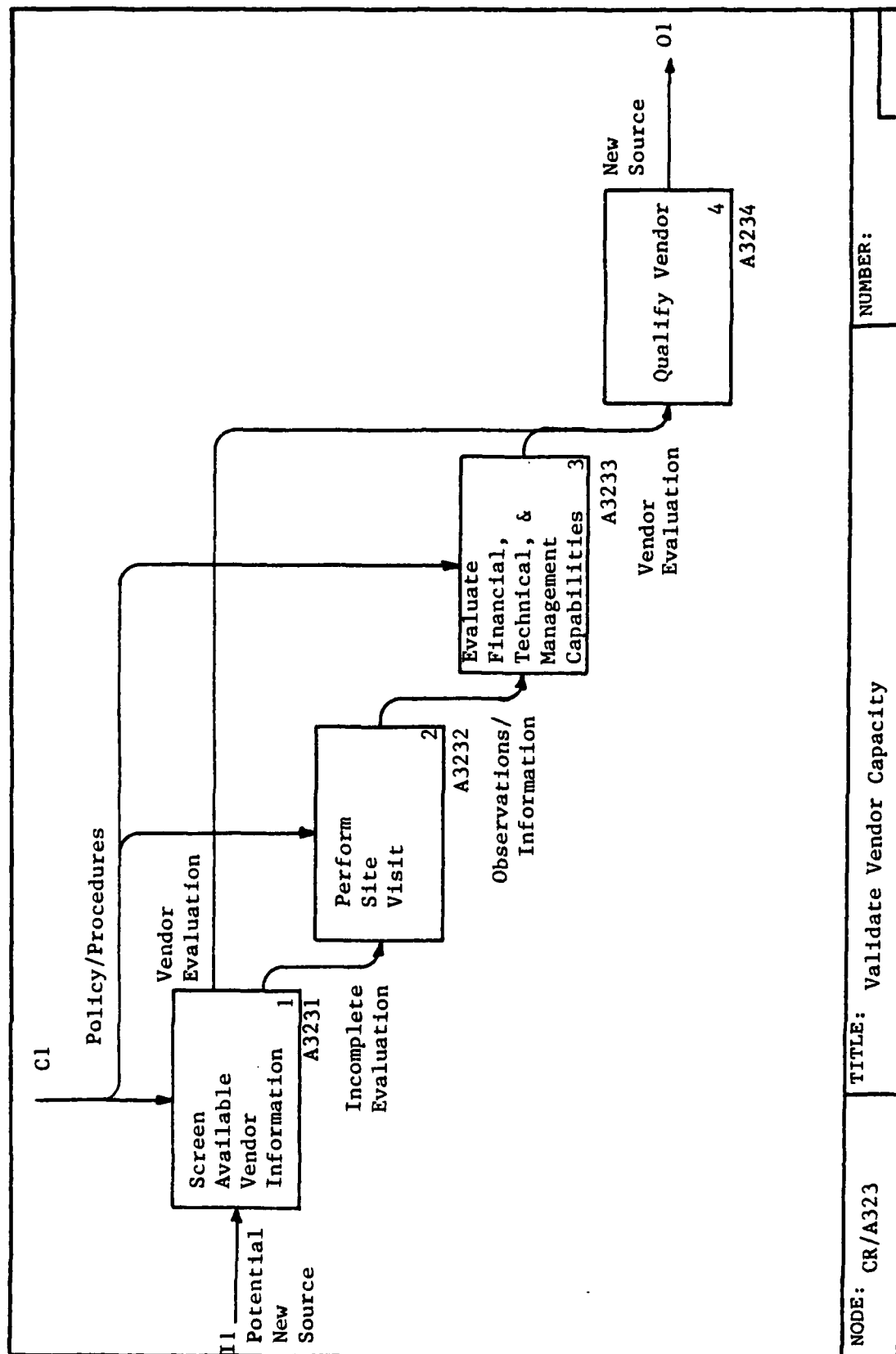




### A323 Validate Vendor Capacity

When a purchase is required in the open market, the vendor information list is screened to determine if the purchase can be made directly from qualified vendors. If vendor qualification as a supplier cannot be determined from database information, a site visit is performed by the Source Development Office (CRS). The site evaluation visit is made to accurately determine and evaluate the vendor's financial, technical, and managerial capability. Once this information is determined, and the vendor satisfies all the necessary qualification standards, the vendor is then listed as a new source and competitor in the marketplace.





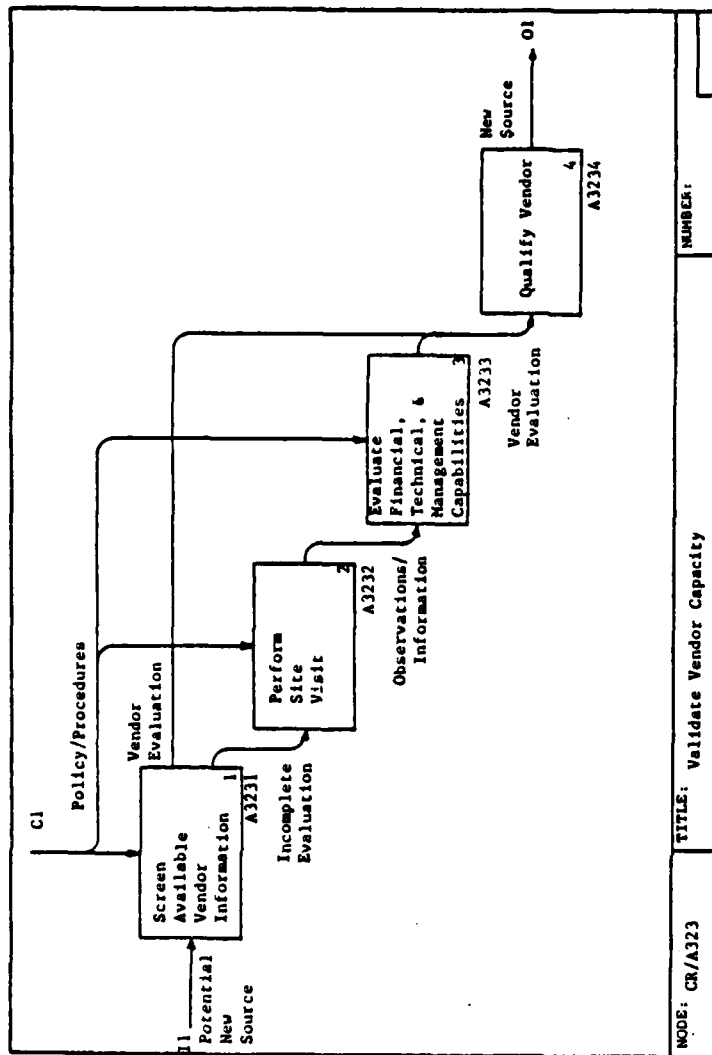
## A3234 Qualify Vendor

With the vendor evaluation complete, a review is conducted to determine if the vendor has met "first article" or "similar article" criteria. Once all requirements are satisfied, the entire vendor evaluation package is sent to the system engineer for concurrence. Upon concurrence of the vendor's qualification, the system engineer's results are then recorded and the database is updated.

## Glossary

**First Article Criteria** - Once the vendor has met the necessary technical, managerial and financial requirements of the site evaluation visit, an evaluation of the product must be conducted. The first article evaluation measures the items ability to meet specified performance standards.

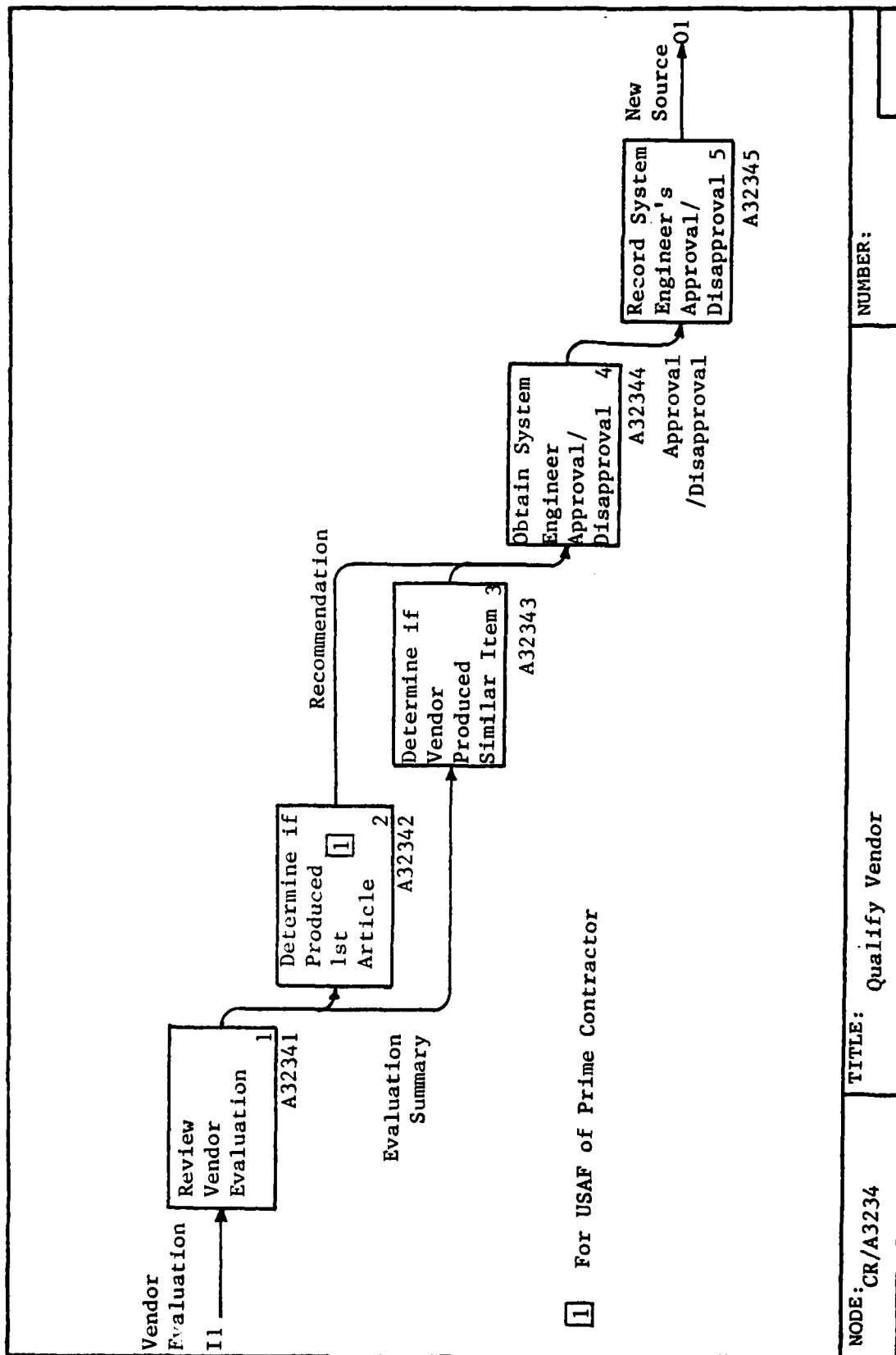
**Similar Item Criteria** - A vendor may satisfy first article criteria through



the evaluation of a similar article. A similar article must possess the inherent qualities, functions, and complexities of the item considered for competition.

**System Engineer** - The system engineer/manager is the individual responsible for the management of

the item being purchased. The system engineer is not part of the CR directorate but is assigned to a requirements determination activity (normally the Directorate of Material Management at an ALC).



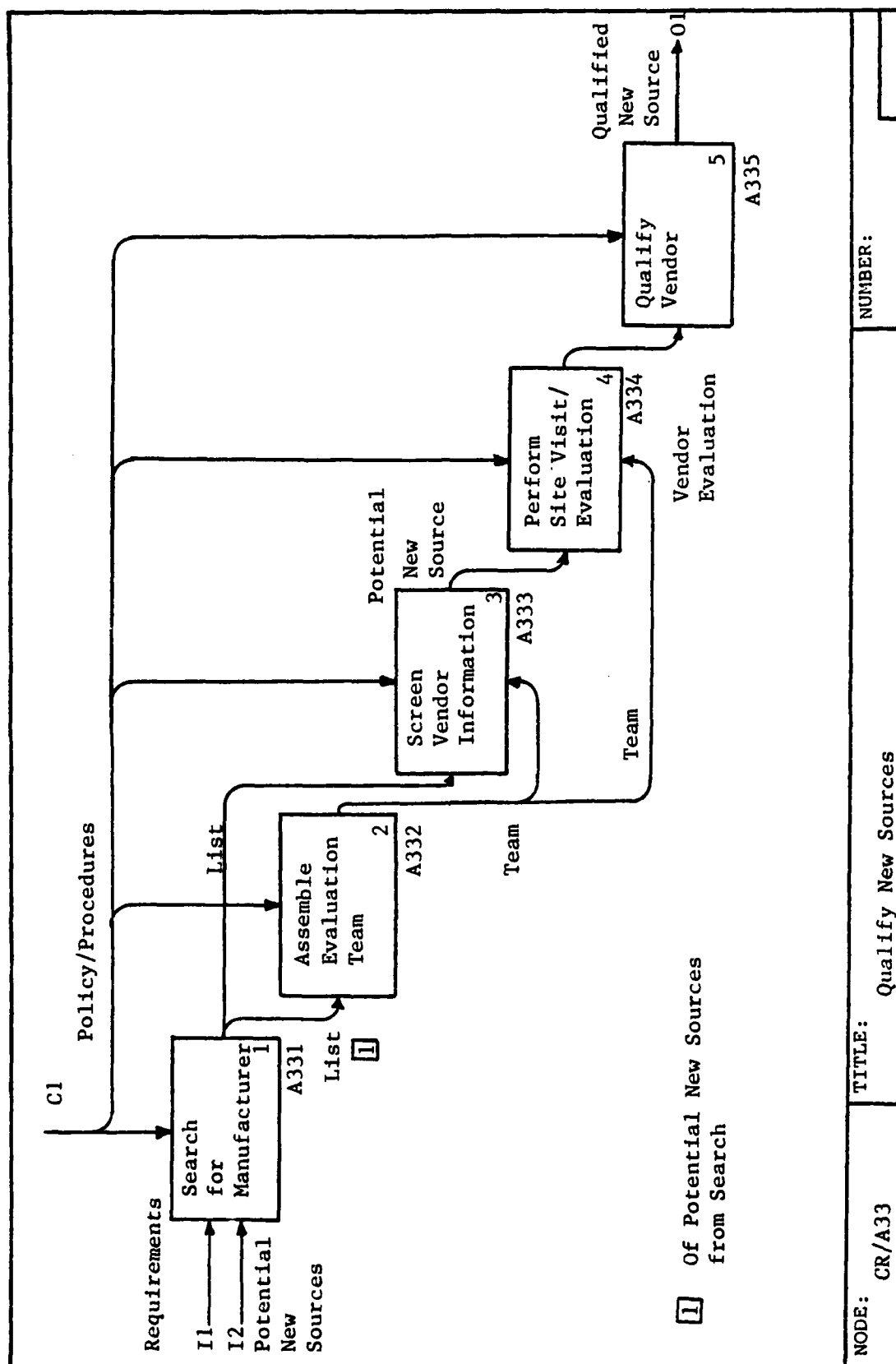
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graph TD
    C1[CI] --> PA[Plan for Future Acquisition A31]
    C1 --> UP[Update Database A34]
    C1 --> QNS[Qualify New Sources A33]
    C1 --> BPP[Breakout Spare Parts A32]
    PA --> FR[Future Requirements I13]
    PA --> R[Requirements]
    R --> BPP
    BPP --> P[Data I12]
    P --> QNS
    QNS --> QNS_Out[Qualified New Source A33]
    QNS_Out --> NS[New Source]
    NS --> UP
    UP --> MI[Management Information A34]
  
```

The flowchart illustrates the Acquisition Process, starting with CI (Control Interface) feeding into four main functional blocks: Plan for Future Acquisition (A31), Breakout Spare Parts (A32), Qualify New Sources (A33), and Update Database (A34). The Plan for Future Acquisition block receives Future Requirements (I13) and outputs Requirements, which then feeds into the Breakout Spare Parts block. The Breakout Spare Parts block outputs Data (I12) to the Qualify New Sources block. The Qualify New Sources block outputs Qualified New Source (A33) to the New Source block, which then feeds into the Update Database block. The Update Database block outputs Management Information (A34) back to the CI. Additionally, the CI feeds directly into the Update Database and Qualify New Sources blocks.

To qualify new sources, the CR function assembles a list of future requirements and compares these requirements with the list of manufacturers or vendors from the database. The search process produces a list of possible manufacturers; those manufacturers or vendors that previously produced the item and those sources that have potential to qualify in the future.

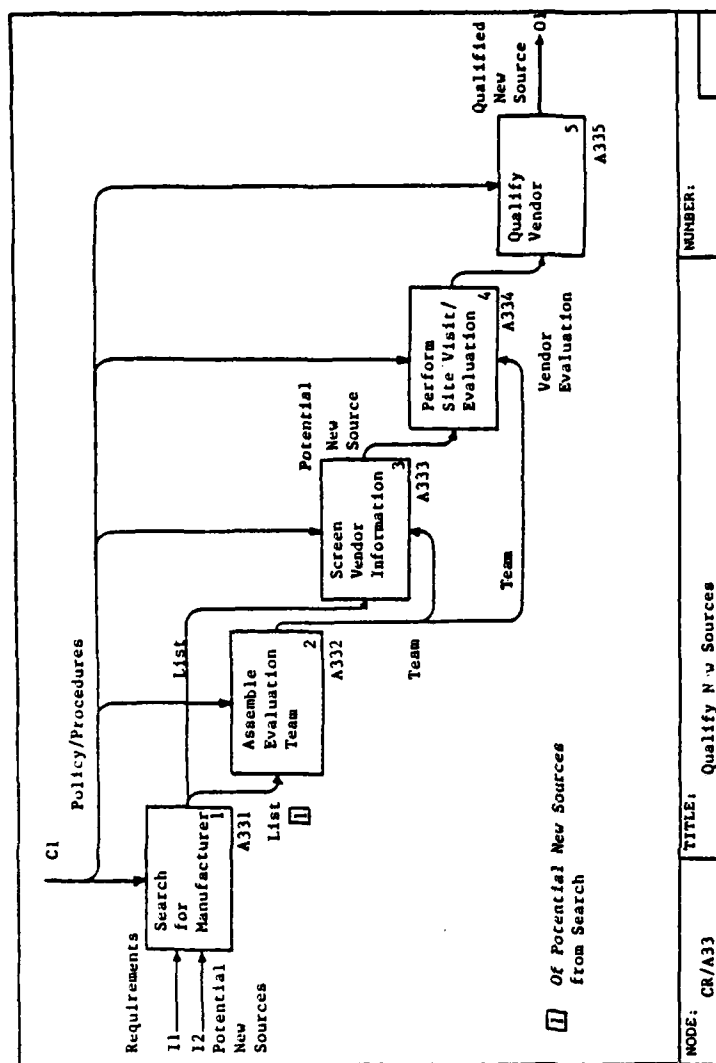
*The list of potential new sources is then screened by the source evaluation team and "potential" new sources are then evaluated at the plant site by the evaluation team. If the site evaluation is successful, the vendor is then listed as a "qualified" new source.*



### A331 Search for Manufacturer

When future requirements are received, the search for a new manufacturer begins with a review of the item's history to determine its description and whether previous suppliers of the item are available. An item description enables Directorate personnel to review trade directories and conduct trade fairs to locate potential new sources.

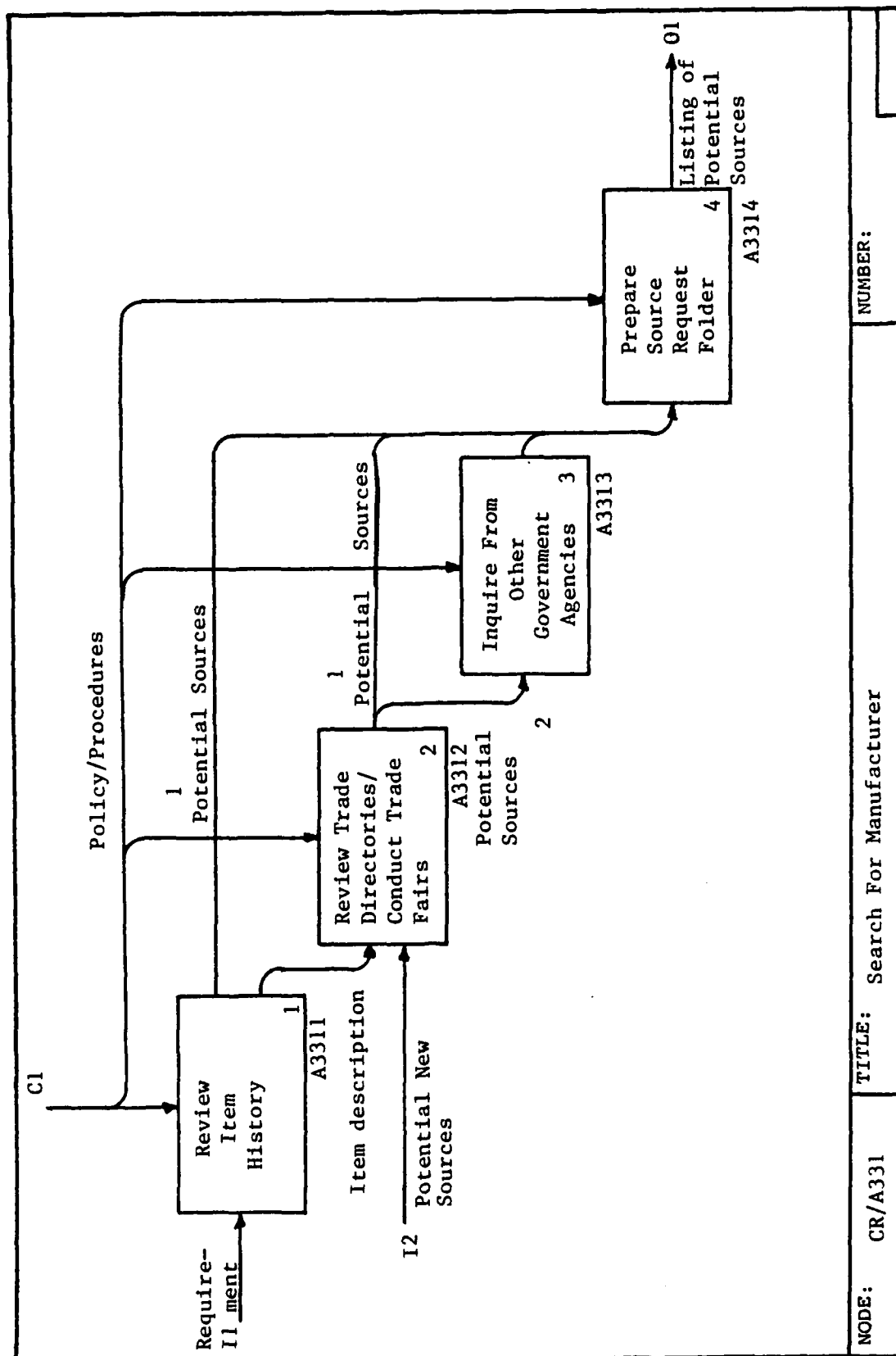
When new sources are identified, the Competition Advocate may have to inquire about the potential new source from other government agencies which have dealt with the vendor before. Also, a new requirement may be for an item previously purchased by another agency. Once potential new sources have been identified for the item, the vendors name is added to the source request folder in the form of a listing of possible bidders.



MODE: CR/A33

TITLE: Qualify New Sources

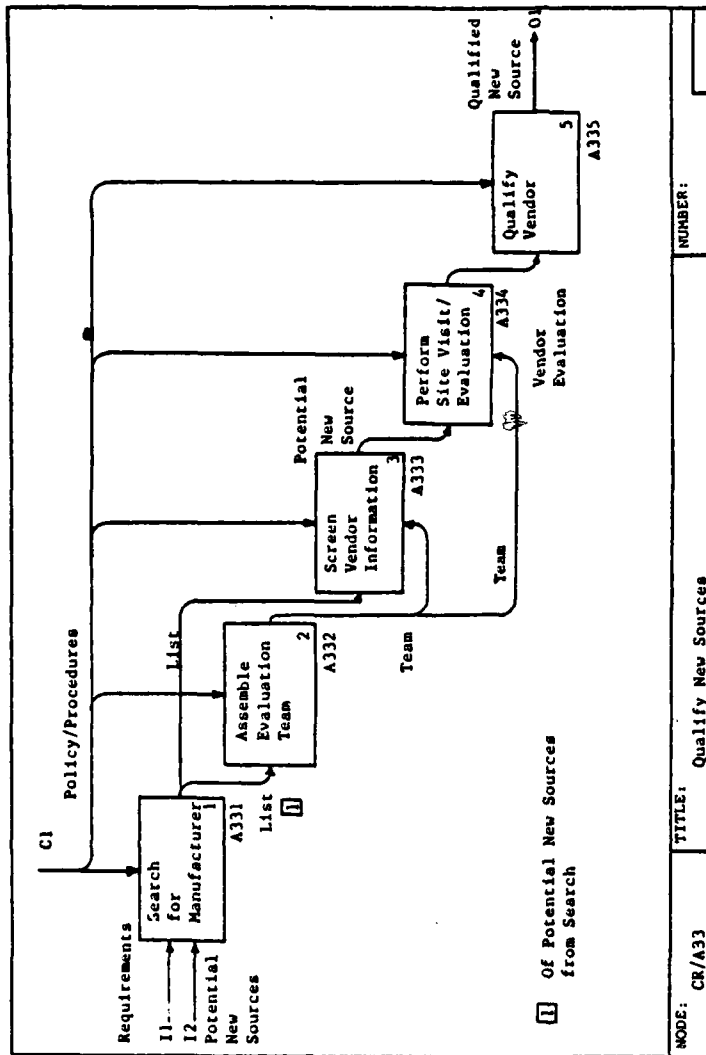
NUMBER:

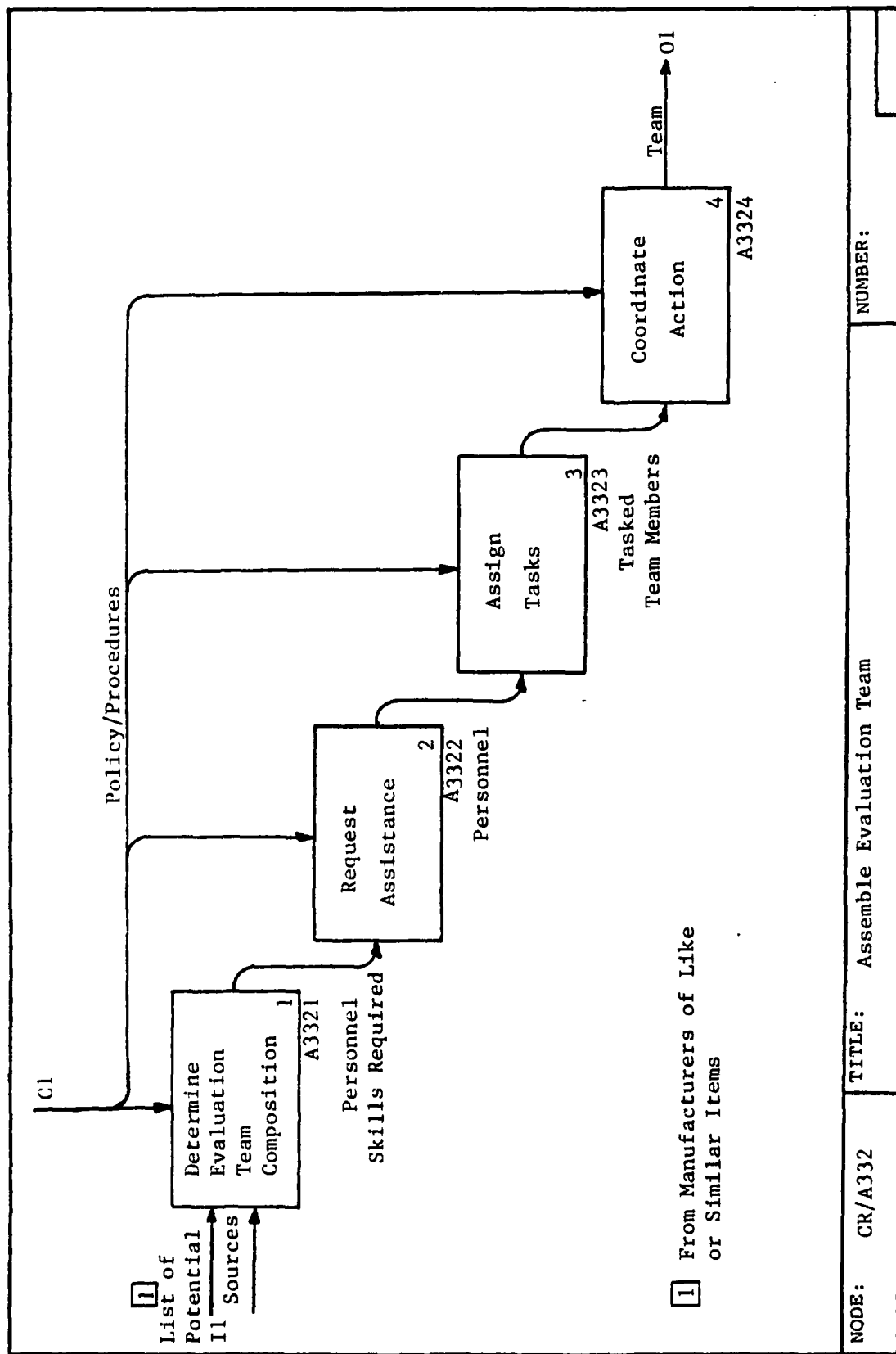




### A332 Assemble Evaluation Team

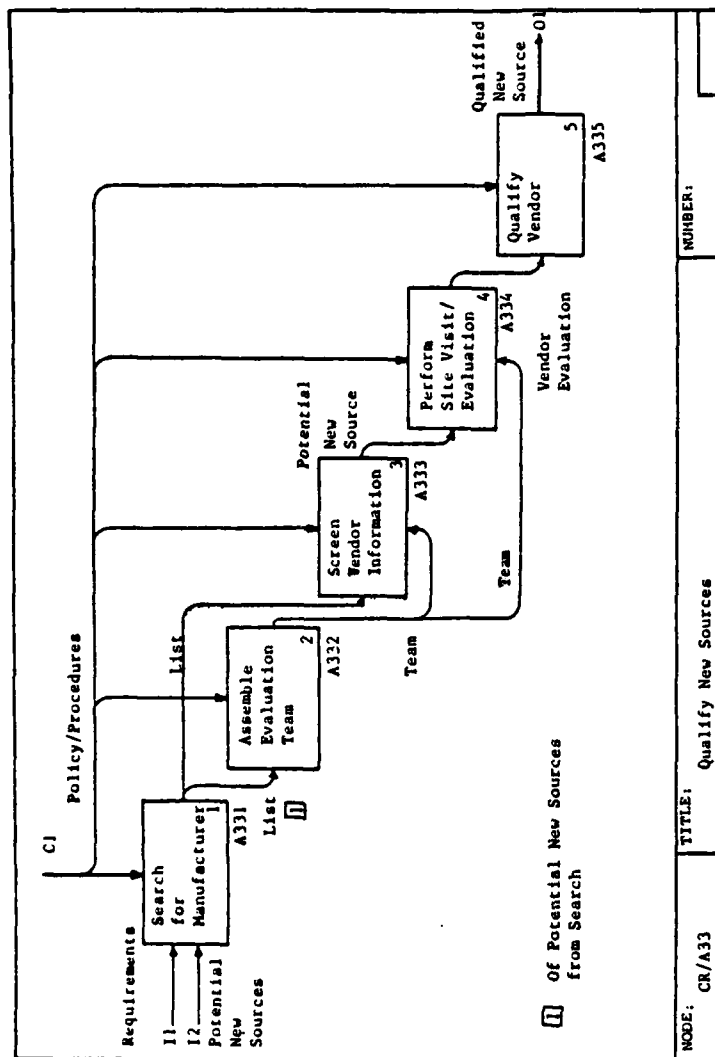
When a potential new vendor is added to the list of possible sources, a requirement may be generated to perform a site evaluation. This visit will determine if the vendor is a responsible source. The composition of the team will be determined by the nature of the industry, the vendor's record, and the nature of the item to be manufactured. When the skill requirements are established, the Source Development Office will request assistance from other offices or divisions within the Directorate and/or other agencies within the ALC. When the personnel are identified, each is assigned their specific tasks and the coordination process begins to ensure that travel, billeting, and transportation arrangements are made. Close liaison with the contractor is required to ensure effective use of the limited time at the contractor's facility.

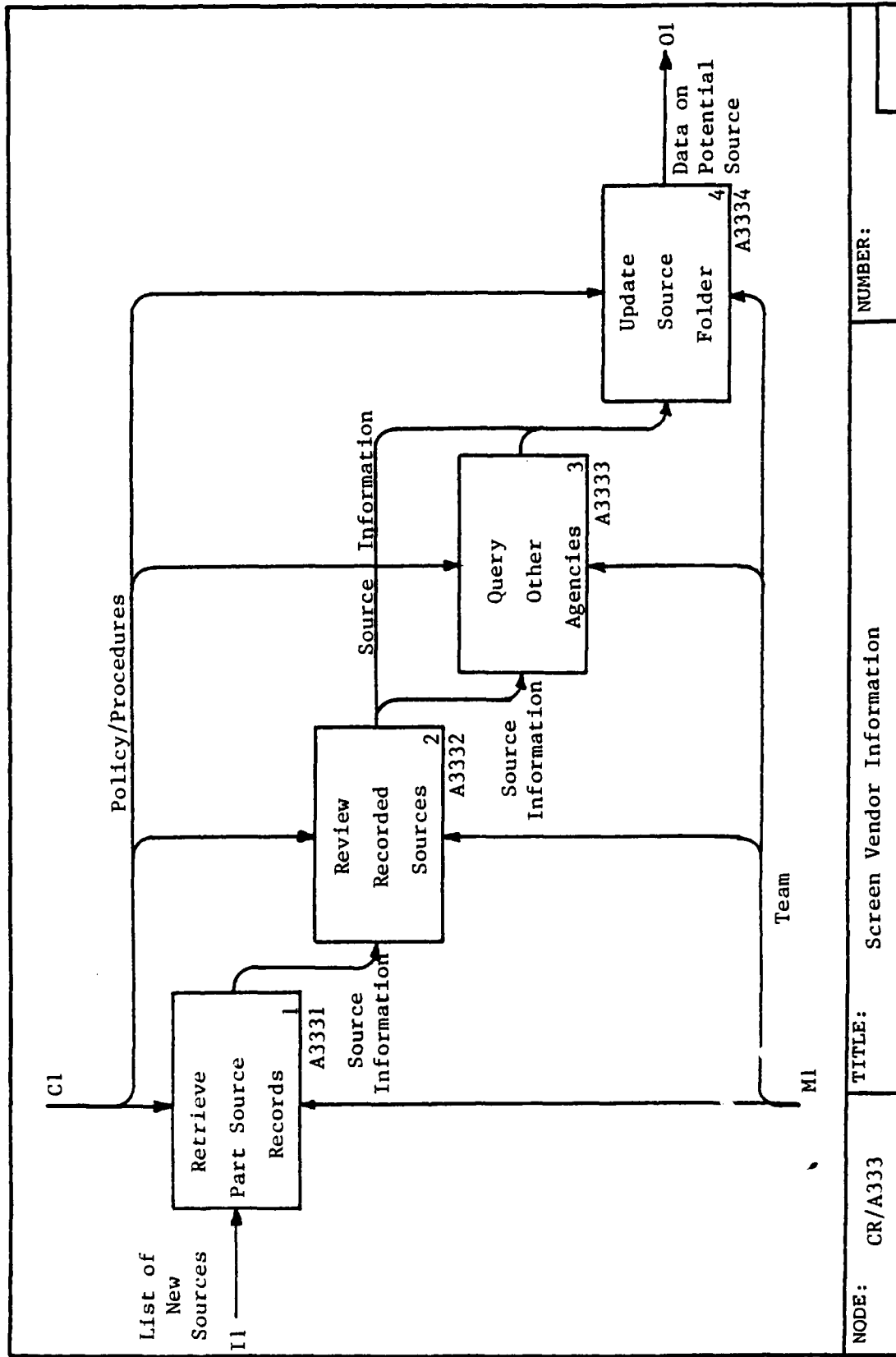




### A333 Screen Vendor Information

To screen vendor information, the site evaluation team obtains source information from the part (purchase) records. The source information is then reviewed to determine completeness and past performance. Should any information be missing, the site evaluation team will query other agencies for the necessary information to complete the source folder. Once complete, the source folder is then updated.





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A DESCRIPTIVE MODEL OF THE DIRECTORATE OF COMPETITION  
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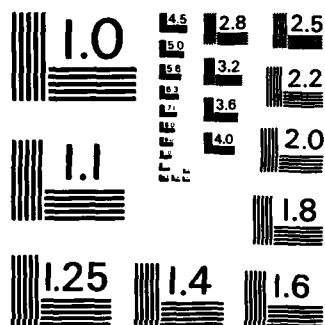
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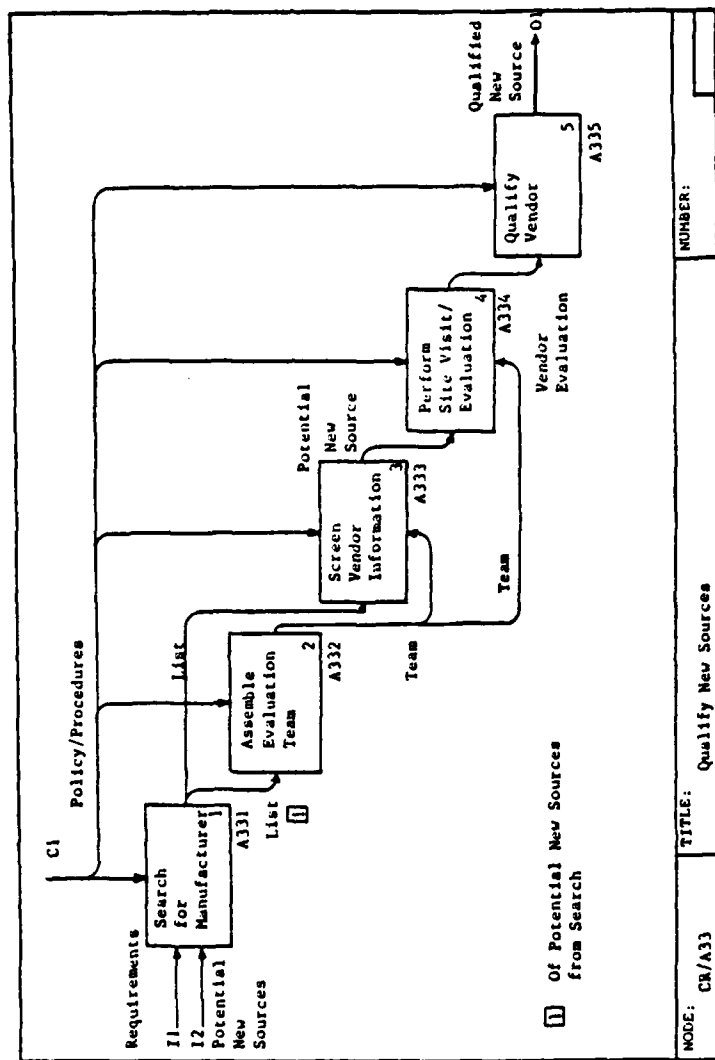
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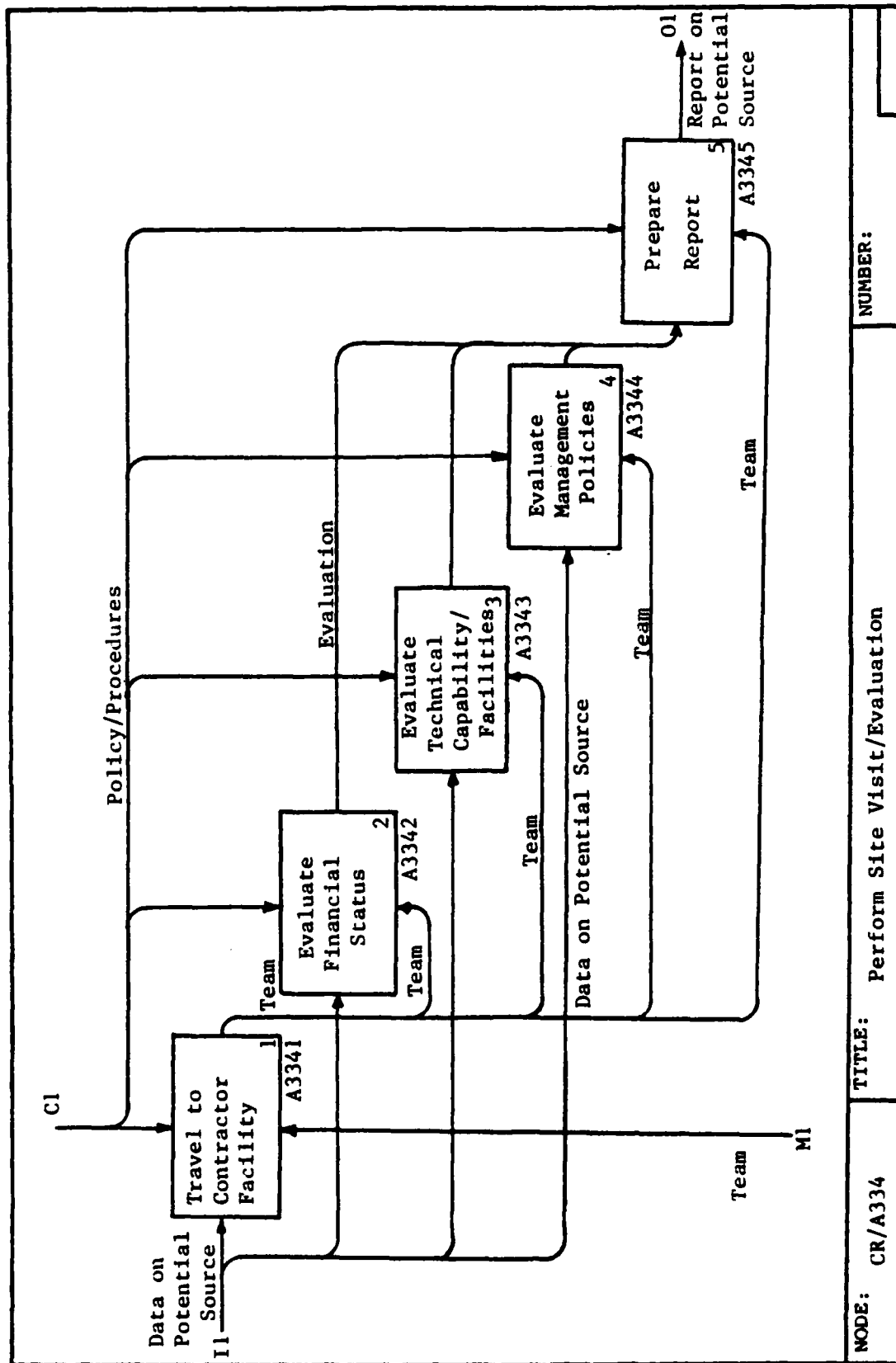


MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

# A334 Perform Site Visit/ Evaluation

With the necessary data on the potential source, the site evaluation team travels to the contractor's/vendor's manufacturing facility. The team, through its specialists, evaluates the contractor's financial status, technical capabilities, and management policies. The results are then compiled into a report on the aggregate capabilities of the potential new source.







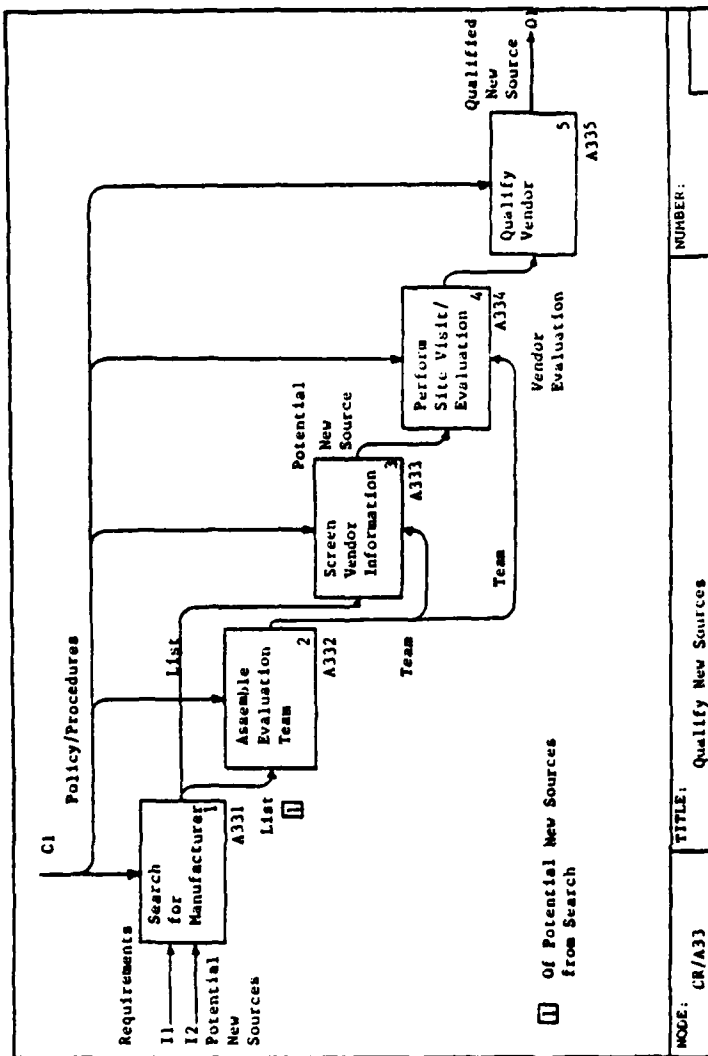
### A335 Qualify Vendor

With the vendor evaluation complete, a review is conducted to determine if the vendor has met "first article" or "similar article" criteria. Once all requirements are satisfied, the entire vendor evaluation package is sent to the system engineer for concurrence. Upon concurrence of the vendor's qualification, the system engineer's results are then recorded and the database is updated.

### Glossary

**First Article Criteria** - Once the vendor has met the necessary technical, managerial and financial requirements of the site evaluation visit, an evaluation of the product must be conducted. The first article evaluation measures the items ability to meet specified performance standards.

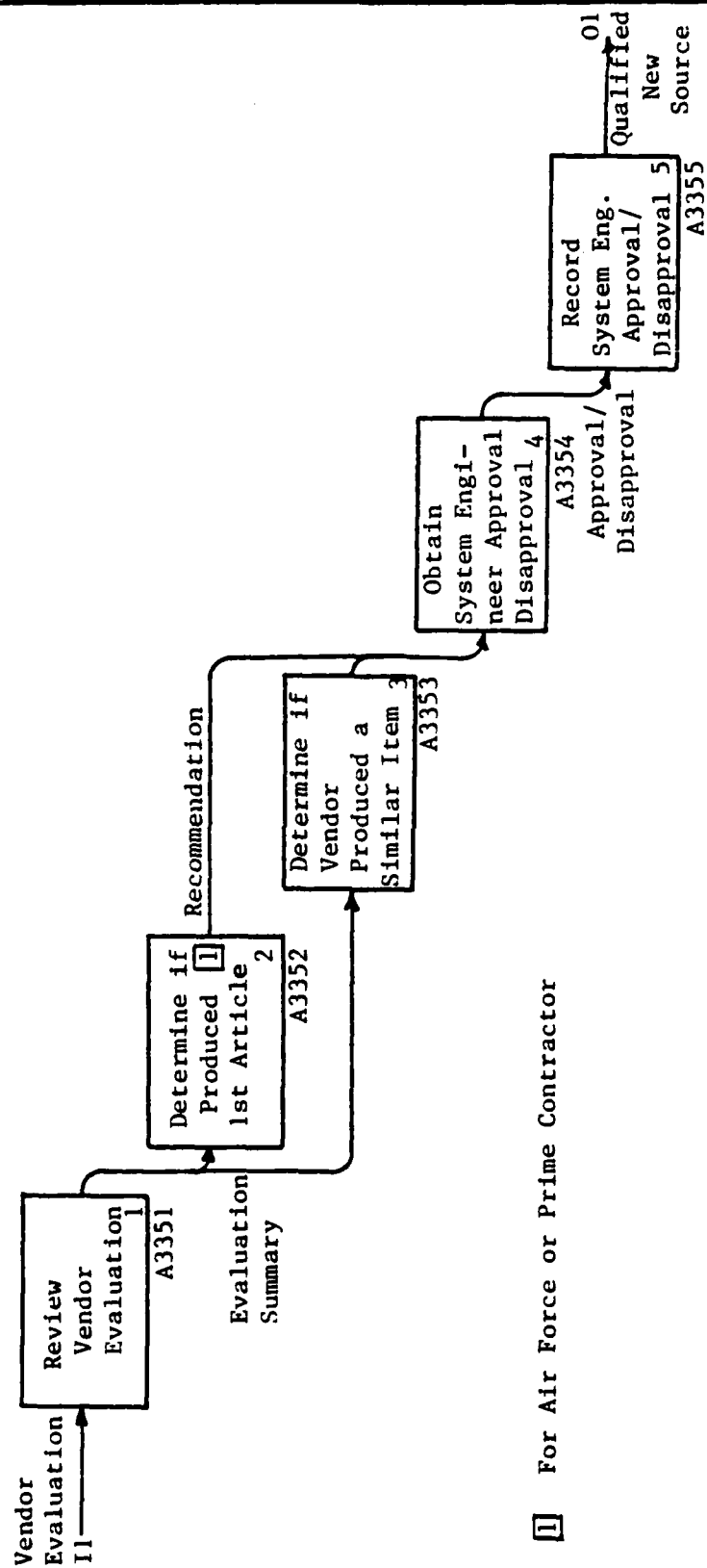
**Similar Item Criteria** - A vendor may satisfy first article criteria through



the evaluation of a similar article. A similar article must possess the inherent qualities, functions, and complexities of the item considered for competition.

**System Engineer** - The system engineer/manager is the individual responsible for the management of

the item being purchased. The system engineer is not part of the CR directorate but is assigned to a requirements determination activity (normally the Directorate of Material Management at an ALC).

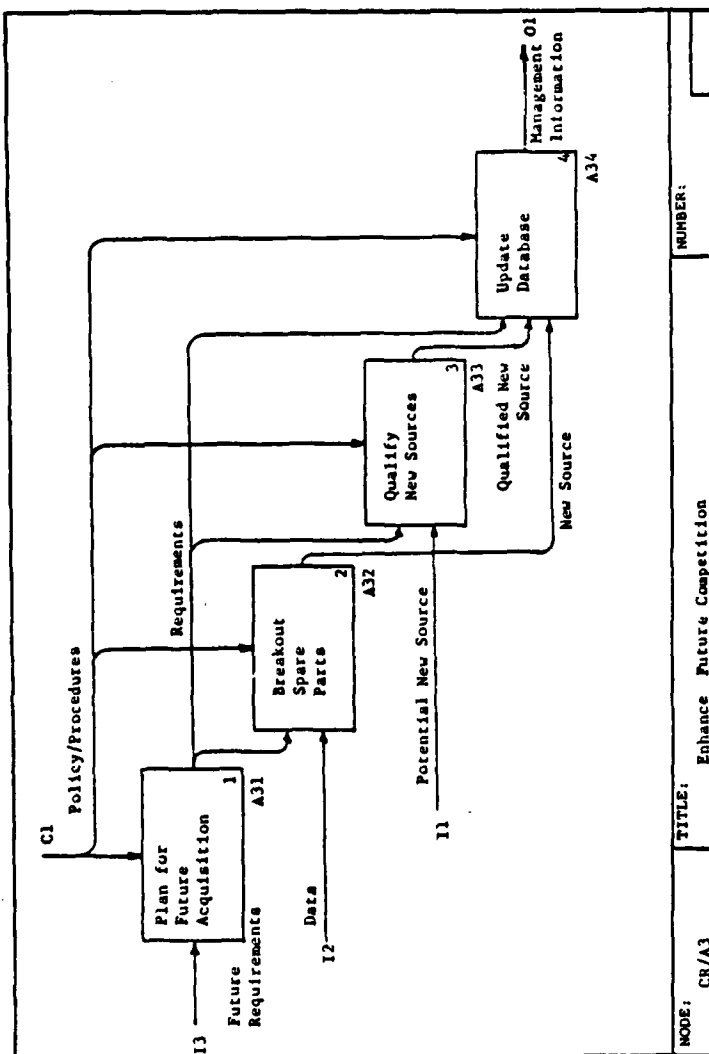


1 For Air Force or Prime Contractor

NODE: CR/A335	TITLE: Qualify Vendor	NUMBER:
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### A34 Update Database

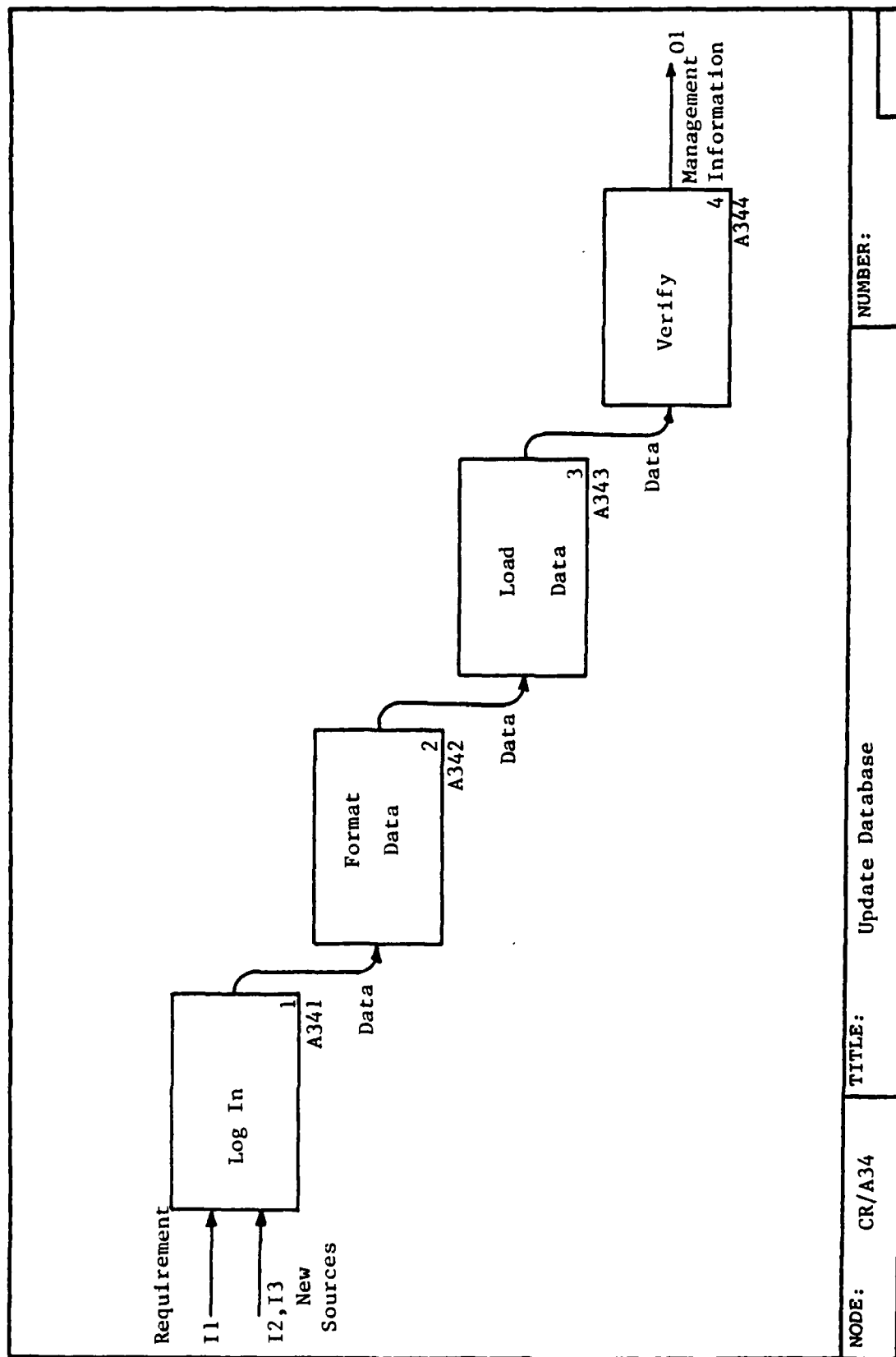
The process of updating the database is a routine function which must be accomplished to ensure that future actions requiring acquisition data can be accurately performed. Verification is an important aspect of this process, and ensures the accuracy of the database.



MODE: CR/A3

TITLE: Enhance Future Competition

NUMBER:



### Summary

This chapter has presented the IDEF<sub>0</sub> model of a Directorate of Competition Advocacy. The data gathering was conducted through personal interviews and a literature review. The model was then validated using IDEF<sub>0</sub> procedures (Figure 3-7). The final model was also reviewed by an IDEF expert to ensure proper IDEF procedures were used.

The next chapter presents the conclusions and recommendations of the research effort.

## V. Conclusions and Recommendations

This chapter presents the results of the research effort. The conclusions are presented as responses to the investigative questions outlined in Chapter I. The recommendations address two general areas: improving competition in defense acquisition, and proposals for future research.

### Overview of Research

The research described the Directorate of Competition Advocacy at an ALC and the role of competition in the acquisition process. The recent emphasis on competition as a means to reduce replenishment spare parts cost, created the rapid evolution of the Competition Advocate Program within AFLC. To develop a comprehensive understanding of the Directorate of Competition Advocacy, it was necessary to investigate the role of competition in defense purchasing. The research was conducted using two methodologies: an extensive literature review and a structured analysis model of the Directorate of Competition Advocacy.

First, the literature review addressed the historical development of acquisition policy within DoD. The historical perspective established a rationale for the emphasis on competition and the creation of a directorate level position for the Competition Advocate at an ALC. The literature review continued with an explanation of market competition and the forces which underlie the effective uses of competition.

The second method used in the research was the structured analysis technique IDEF<sub>0</sub>. A formally structured process of literature search,

personal interviews, and diagram construction was used to build the model on a functional rather than an organizational basis. This approach emphasized what tasks are performed, and not who performs the tasks.

### Conclusions

The following conclusions are presented in response to the three investigative questions.

Investigative Question One. What is the role of competition in the defense acquisition process?

The role of competition in the defense acquisition process is to act as the catalyst to achieve effective use of resources. From Chapter I, the complexity of a clear definition of competition is evident. A basic assumption of the free enterprise system is the relationship between buyers and sellers in the marketplace. Competition may be a rivalry between adversaries or between parties with mutual interests. Sellers compete for the resources of various buyers in the marketplace. In defense acquisition, the market structure and product dimensions require a competitive posture based on multiple factors such as performance, schedule, and supportability.

As a tool to achieve the effective use of resources, competition is not restricted to the formal advertising method of contracting. Competition is achieved when more than one source seeks to provide the product or service sought by the purchasing agency. Whether the buying process is by formal advertising or negotiation, competition can be present. The negotiation process, illustrates the continuation of com-

mpetition between rivals as described in Webster's definition. The buyer and seller seek to optimize their relative financial well-being and maximize the return of the resource exchange.

The effective use of competition can provide significant benefits. When properly applied, competition rations scarce resources to those producers who provide the buyer with an appropriate product at minimum cost. In this context, emphasis on a short-run financial advantage may force the buyer, through resource rationing, to select a producer whose product requires the least amount of present resources. However, this may require the additional expenditure of future resources because of reduced performance or increased supportability costs. In specific market structures, effective competition has been shown to reduce prices, improve product performance, and expand the industrial base.

In most cases, competition can produce much needed benefits; however, it does not always guarantee reduced cost. The seller's experience or technical capability may lack the necessary attributes for optimal performance. In a competitive environment, the potential for an expanded industrial base is increased; however, in certain industries the inappropriate use of competition would drive the less efficient producers out of the marketplace and thus reduce the industrial base.

Investigative Question Two. What factors and events led to the creation of Directorates of Competition Advocacy at AFLC's Air Logistics Centers?

The literature review and interviews conducted while building



the IDEF<sub>0</sub> model provided a historical perspective on the background of AFLC's Competition Advocacy Program. Competition in defense acquisition has been a basic assumption throughout the history of the United States. Formal advertising, while the preferred method of contracting, was not an exclusive means to obtain competition. The exclusion of formal advertising during World War II illustrated that competition could be achieved in specific product dimensions.

The organizational inertia created by the use of negotiation during World War II continued into the post war period. The technology of the space race and the advances of Soviet Union created an atmosphere in which cost, performance, and schedule competed for priority among the product dimensions. A trend began to develop as contractors became more specialized and the defense industrial base declined. Several factors caused an increasing number of contracts to be awarded on a sole-source basis. For replenishment spare parts, the lack of engineering data or data rights precluded competitive purchases. This lack, of data was a result of limited acquisition funds and an increasing threat that forced the trade-off of supportability for weapon system delivery and performance. As a result, only minimum essential engineering data was purchased.

Acquisition costs increased rapidly during the 1970s. Technology, scarce strategic materials, and inflation were major contributing factors. Replenishment spare parts were not excluded from the overall increase in defense acquisition cost.

The combined effect of increased cost and sole-source purchasing led to a critical assessment of the defense acquisition process. The

media reports and Congressional inquiries of DoD's efforts to correct its problems, caused a loss of public confidence in the defense acquisition process. The Acquisition Improvement Program sought to remedy this situation. The Competition Advocate concept was only one of 32 initiatives to reduce cost and improve the acquisition process. The Air Force, through the AFMAG, addressed the problems specifically relating to replenishment spare parts. As a result of implementing the AFMAG recommendations, AFLC elevated the Competition Advocate to directorate level. The organization was staffed to implement the full range of AFMAG recommendations.

Investigative Question Three. How is the Directorate of Competition Advocacy structured and functioning?

The literature review shows that AFLC Regulation 23-49, the Directorate of Competition Advocacy, follows the recommended organizational structure of the AFMAG Report. The Directorate has two major divisions and two offices; the Engineering Data Management Division (CRE), the Price Appraisal Division (CRV), the Source Development Office (CRS), and the Resource Management Office (CRX). The specific responsibilities of each organizational element are included in AFLCR 23-49.

The IDEF<sub>0</sub> model of the Directorate describes "how" the organization enhances the role of competition. Using the context of time, the organization performs three basic functions to improve public confidence in the acquisition process: correcting past deficiencies, achieving competition in current acquisitions, and enhancing competition for future purchases. The results of correcting past problems

directly supports current and future actions. Through planning and active participation in future acquisitions, the Directorate enhances the processes which promote effective competition.

Interviews conducted during the model building process further illustrated that many of the specific tasks assigned to the Directorate of Competition Advocacy were previously assigned to other directorates. A shortage of personnel and conflicting priorities inhibited effective and timely accomplishment of these tasks. An observation was made that the assignment of more personnel to existing directorates may have solved these problems. However, the literature review suggests that organizational inertia might have minimized the effectiveness of this alternative. As a separate directorate, the Competition Advocate performs not only tasks previously accomplished by other directorates; but, performs an oversight function as well. It has an active role which corrects the deficiencies of the past, enhances current acquisition, and promotes competition in the future.

### Recommendations

The following recommendations are made to enhance competition as a tool in the acquisition process and to suggest future research. The recommendations do not reflect new concepts or ideas, rather they emphasize programs and needs which have been addressed, but continue to require attention.

For Competition. The first recommendation is to improve the management and storage of the massive engineering database, computerized systems should be developed as soon as possible. A coordinated

effort by AFSC, AFLC, and private industry should be undertaken to develop standards for the use and storage of computerized engineering data.

To improve the efficiency of reverse engineering, increased investment in Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) systems should be made. These systems would enable ALC engineers to rapidly reconstruct the drawings and specifications essential to making an item competitive.

For Future Research. The IDEF<sub>0</sub> model of the Directorate of Competition Advocacy used the "as is" approach. It is recommended that descriptive organizational research in the future also use the IDEF<sub>0</sub> methodology. To implement proposed changes to an organization or system, the "to be" approach can be used. This approach will ensure that all essential functions are included in the new organization.

Future research that intends to model management information and establish data requirements for a Management Information System (MIS), should consider developing an IDEF<sub>1</sub> information model. The IDEF<sub>1</sub> information model could be developed as a follow-on to an existing IDEF<sub>0</sub> model, or as an integrated team effort which develops both the IDEF<sub>0</sub> and IDEF<sub>1</sub> models.

Appendix: IDEF<sub>0</sub> Glossary [53: Sec A, 2-5]

Arrow	A line representing data, its source (no point) and its use (point on the end of the line).
Author	The person who prepares any IDEF model.
Box	A rectangle, containing a name and number, used to represent an activity.
Branch	A fork or a join.
C-Number	A chronological number used near the lower right hand corner of an IDEF diagram form to:• uniquely identify the diagram; trace the history and filing of an author's diagrams. C-numbers may be used as Detail Reference Expressions.
Call	A pointer (outward pointer on the bottom of a box) used to show that the box is detailed by the decomposition of another box.
Commenter	A person who has enough training in an IDEF technique to offer structured comments using the note numbering system and (often) referring to flaws in the application of the technique itself.
Context	The immediate environment in which a model is to operate; the limits of the model. In IDEF <sub>0</sub> the arrows around any box, but particularly the box on an A-0 diagram. Also, the small box on the IDEF form in which the parent diagram and box are identified.
Control	The class of arrows associated with the top of an IDEF <sub>0</sub> box. Provides guidance to the transformation.
Data	Anything namable by a noun phrase such as things, conditions or information. Usually refers to a class (such as person) but may mean a single instance ("John Jones").
Detail Reference Expression	The C-number or node number written beneath an IDEF <sub>0</sub> box to show that it is detailed and where.

Draft	An approval level for an IDEF diagram form above "working" and below "recommended."
Expert	A person familiar with a part of the real world system being modeled. May serve as a source of information or as a reviewer of part of the model.
FEO	A diagram "For Exposition Only" in which violation of normal syntactic rules is allowed.
Fork	The point at which an IDEF <sub>0</sub> arrow (going from source to use) divides into two or more arrows.
Function	An activity described by a verb phrase that identifies what must be accomplished.
Glossary	A required section of an IDEF model which defines the way in which words or phrases are used.
ICOM	A single use of the ICOM code system. The acronym of <u>I</u> nterface, <u>C</u> ontrol, <u>O</u> utput, <u>M</u> echanism. The arrows so labeled.
IDEF Role	A position in an IDEF project. See author, expert, commenter, reader, librarian.
Input	The arrow class associated with the left hand side of an IDEF <sub>0</sub> box. Usually becomes part of the output.
Join	The point at which an IDEF <sub>0</sub> arrow (going from source to use) joins with one or more other arrows to form a single arrow.
Kit	The standardized packages of diagrams which contain portions of, or complete to date, models to be reviewed. See kit cycle.
Kit Cycle	A formal procedure for obtaining peer or expert review during model development.
Label	The name associated with an IDEF <sub>0</sub> arrow.
Librarian	The person responsible for: <ul style="list-style-type: none"> <li>- routing and tacking of kits</li> <li>- project files</li> </ul>

Mechanism	The arrow class associated with the bottoms of IDEF <sub>0</sub> boxes.
Model	A representation of a system which can be used to answer questions about the system.
Modeler	An alternate term for author.
Node	A point at which subsidiary parts originate or center. The number associated with an IDEF <sub>0</sub> box or diagram. (Each activity may be shown once as a box and once as a diagram.)
Node List	A listing, often indented, showing all nodes in an IDEF <sub>0</sub> model in "outline" order.
Node Diagram	A graphic representation of the relationship between the nodes of an IDEF <sub>0</sub> model.
Note	A comment on an IDEF diagram to record a fact outside those normally treated by the method or a comment by a reader or commenter about a diagram.
Output	The class of arrows associated with the right hand side of the IDEF <sub>0</sub> boxes. The result of an IDEF <sub>0</sub> transformation.
Parent	The diagram on which the box appears which is detailed by the "offspring" diagram.
Project	The organized task for which an IDEF model is prepared.
Project Manager	The member of the project who has final responsibility for the finished product.
Publication	The highest approval level for an IDEF diagram.
Purpose	A brief statement of the use to be made of a model so that the reason for its existence is clear.
Reader	A person with no, or limited, training in an IDEF technique who sees part or all of the model. A reader will often comment, but his comments are not expected to be structured. Individuals or groups participating in a walkthrough of a diagram are normally grouped as "readers."

Recommended	The next-to-highest approval level for an IDEF diagram.
Technical Committee	The group authorized to guide the development of a model and, eventually to approve its contents.
Text	An overall verbal comment on an IDEF <sub>0</sub> diagram appearing on a separate diagram form.
Tunnelled Arrow	An IDEF <sub>0</sub> arrow one end of which is not associated with an arrow on the parent or offspring diagram.
Viewpoint	An attempt to define the subset of possible facts within a context which will be portrayed. Often expressed in terms of the persons whose perceptions are portrayed.
Working	The lowest approval level for an IDEF diagram. All IDEF diagrams are initially classified "working."



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## VITA

Major Edgar H. Hirshouer was born on 3 December 1948 in Columbus, Ohio. He graduated from the University of Arizona in January 1971 with a Bachelor of Science in Electrical Engineering, and received his commission through the AFROTC program. He completed Pilot Training at Williams AFB, Arizona in May 1972. He was then assigned to the 361st Tactical Electronic Warfare Squadron, Nakhon Phanom AB, Thailand as an EC-47 pilot. Following completion of the Air Traffic Control Operations course in May 1974, Major Hirshouer served as an Air Traffic Control Operations Officer with the 1901st Communications Squadron, Travis AFB, California. His next assignment was Chief, Air Traffic Control Operations 1973 Communications Squadron, Maxwell AFB, Alabama. In February 1978, he was assigned to the 1867th Facility Checking Squadron, Yokota AB, Japan as a Navigational Aids Flight Inspection Pilot and Chief of Aircrew Evaluation. In June 1980, he was assigned to the 9th Military Airlift Squadron, Dover AFB, Delaware as a C-5A pilot. During that assignment, he also served as a Senior Duty Officer with the 436th Military Airlift Wing Command Post. Major Hirshouer entered the School of Systems and Logistics, Air Force Institute of Technology in May 1984.

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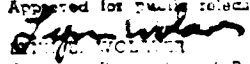
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Competition has been promoted as a means to reduce defense costs. Several initiatives within the government have emphasized and encouraged the increase of competition in federal acquisition. A major effort within the USAF is the Air Force Logistics Command's (AFLC) Competition Advocacy program. AFLC has established a Directorate of Competition Advocacy at each of its Air Logistics Centers (ALC) to promote and enhance competition in all ALC purchases. This thesis is a descriptive research effort undertaken to describe the information flows and functional processes that occur within the Directorate of Competition Advocacy at an ALC. The study uses the Integrated Computer-Aided Manufacturing (ICAM) Definition Method (IDEF<sup>2</sup><sub>0</sub>) to construct the model. The background literature search provides an historical overview of competition in federal buying from the late 18th century to the enactment of the Competition in Contracting Act (CICA) of 1984. The overview also identifies the problems associated with the implementation of increased competition in various market structures and discusses the organizational impacts of such a change.

The results of the research are presented in the form of IDEF<sup>2</sup><sub>0</sub> diagrams which illustrate the functional processes associated with an ALC's Directorate of Competition Advocacy. Recommendations for the enhancement of competition and future research are also included in the study.

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